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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Application Number	10/516,500 ✓
Filing Date	29 Nov 04
First Named Inventor	J.L. HANCKE-OROZOCO
Group Art Unit	
Examiner Name	
Attorney Docket Number	Herbal Powers

Total Number of Pages in This Submission 97

ENCLOSURES (check all that apply)

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Fee Transmittal Form
<input checked="" type="checkbox"/> Fee Attached
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<input type="checkbox"/> Affidavits/declaration(s)
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Pharmaceutical Patent Attorneys, LLC 55 Madison Avenue, 4th floor, Morristown NJ 07960-7397 USA
Signature	
Date	20 July 2005

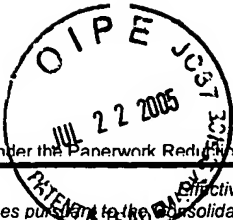
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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005☐ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$) 180.00**Complete if Known**

Application Number	10/516,500
Filing Date	29 Nov 04
First Named Inventor	J.L. HANCKE-OROZCO
Examiner Name	
Art Unit	
Attorney Docket No.	Herbal Powers

METHOD OF PAYMENT (check all that apply)☐ Check ☒ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☐ Deposit Account Deposit Account Number: _____ Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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☐ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)
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- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims

Fee (\$)	Fee Paid (\$)
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3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
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- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Petition to make examination special

Fees Paid (\$)

180

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 35,325	Telephone (973) 984 - 0076
Name (Print/Type)	J. Mark Pohl		Date 20 July 2005

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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5 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

10
15 *In re* Application of J.L. HANCKE-
 OROZCO *et al.*, United States Utility
 Application Serial No. 10/516,500
 Filed __ June 2005

20 PETITION UNDER 37 C.F.R. § 1.102
 TO MAKE EXAMINATION SPECIAL

25 Applicants respectfully requests that examination of this Application and any continuation
application be made Special pursuant to 37 C.F.R. § 1.102(d) and MANUAL OF PATENT EXAM.
PROC. § 708.02 ¶ X (2001):

STATEMENT OF FACTS

- 30 1. The United States Patent Office will accord “special” status to patent examinations relating
to HIV / AIDS. MANUAL OF PATENT EXAM. PROC. § 708.02 ¶ X (2001).
2. To be accorded special status, the applicant must explain how the invention contributes to
the diagnosis, treatment or prevention of HIV / AIDS. Id. Here, the claimed invention has
particular importance in the treatment of HIV / AIDS.
- 35

3. Acquired Immuno-deficiency syndrome ("AIDS") is treatable with a variety of antiviral pharmaceuticals. These include abacavir alone (commercially available as ZIAGEN®) and in combination (commercially available as TRIZIVIR®), amprenavir (commercially available as AGENERASE®), delavirdine (commercially available as RESCRIPTOR®), didanosine-ddl
5 (commercially available as VIDEX®, VIDEX EC®), efavirenz (commercially available as SUSTIVA®), hydroxyurea (commercially available as HYDREA®), indinavir (commercially available as CRIXIVAN®), lamivudine-3tc (commercially available as EPIVIR®), lopinavir (commercially available as KALETRA®), nelfinavir (commercially available as VIRACEPT®), nevirapine (commercially available as VIRAMUNE®), ritonavir (commercially available as
10 NORVIR®), saquinavir (commercially available as INVIRASE® and FORTOVASE®), stavudine-d4t (commercially available as ZERIT®), tenofovir disoproxil fumarate (commercially available as VIREAD®), zalcitabine-ddc (commercially available as HIVID®), zidovudine (a/k/a azidothymidine) (commercially available alone as RETROVIR® and in combination as COMBIVIR®).

15 4. These pharmaceuticals provide some efficacy to slow the progress of the disease. These pharmaceuticals are, however, relatively expensive, even when sold at an ostensibly "discount" price. For example, COMBIVIR® (300 mg) currently costs \$1,699.99 to \$1,853.98. DestinationRx, Inc., PRICE COMPARISON (available at www.destinationrx.com) (11 Dec. 2002) (copy attached). Similarly, SUSTIVA® (600 mg) costs \$1,077.38 to \$1,099.37, and VIRACEPT®
20 (250 mg) costs \$1,848.12. Id.

5. Given these drug prices, the daily cost of AIDS therapy is significant. For example, VIRAMUNE® (200 mg) costs perhaps \$900 for 180 tablets. Id. This is \$5.00 per tablet. The

VIRAMUNE® label says the usual dose is one 200 mg tablet twice a day - thus, a cost of \$10 per day. Id. Further, the label says VIRAMUNE® “is taken with at least one other medication (antiretroviral) for HIV.” Id. Thus, the total cost of drug therapy is \$10 per day for VIRAMUNE®, plus the cost of “at least one other medication (antiretroviral) for HIV.”

5 6. While the daily cost of HIV drug therapy is significant, the HIV-infected population is characterized by a high incidence of poverty. This is because “high medical bills (even for the health insured) combined with a decreased ability to work renders many persons with HIV/AIDS indigent. Nearly all of [AIDS Service Center’s] clients live in poverty.” Philanthropic Research, Inc., *Give Me Your Hungry*, (quoting Peter Massey, Foundations Manager of The AIDS Service
10 Center) (available at www.guidestar.com) (2002) (copy attached).

7. AIDS infection has been shown to dramatically decrease household income. BOOYSEN, F. le R. *et al.*, *HIV/AIDS, Poverty and Growth*, (Annual Conference of the Centre for Study of African Economics) (18 March 2002) (copy enclosed). For example, household members spend an average of 7.5 hours per day providing care to the sick family member, id. at 8, and deplete
15 their household savings, id. at Table 8. Thus, “[HIV-affected] households are poorer than non-affected households, regardless of whether income is measured at eh household or individual level,” id. at 10, and “affected households are poorer than non-affected households when expenditure is used as a measure of socio-economic status (Table 5), regardless of whether average monthly household expenditure is aggregate, per capita or adult equivalent terms, id. at 11.
20 These “aspects of the socio-economic impact of HIV/AIDS combine to create a vicious cycle of poverty and HIV/AIDS in which affected households are caught up. As adult members of the household become ill and are forced to give up their jobs, household income will fall.” Id. at 28;

see also BOOYSEN, F. le R., *HIV/AIDS and Poverty: Evidence for a Household Impact Study* (DPRU Confrence) (22 Oct. 2002) (copy enclosed).

8. Accordingly, the JOURNAL OF HEALTH & SOCIAL POLICY concludes, "Urban centers in America are the hardest hit by the HIV/AIDS epidemic. The incidence of HIV/AIDS is higher in these areas because of high levels of poverty ... and the limited participation of urban residents in the design and delivery of health services." AKUKWE, Chinua, *The Need for an Urban HIV/AIDS Policy In the United States*, 12 JOURN. HEALTH & SOC. POLICY 1 (2001) (abstract only) (copy attached).

9. To meet the need of patients for potentially less-costly AIDS therapeutics, the inventors have researched the efficacy of the chemical compound 3-[2-[decahydro-6-hydroxy-5-(hydroxymethyl)-5,ha-dimethyl-2-methylene-1-naphthalenyl]ethylidene]-dihydro-4-hydroxy-2(3h)-furanone, and its utility for treating HIV / AIDS. The invention is described in the pending claims (claim numbers 53 *et seq*). Claim 53, for example, is drawn to a method of treating Acquired Immune Deficiency Syndrome by administering 3-[2-[decahydro-6-hydroxy-5-(hydroxymethyl)-5,ha-dimethyl-2-methylene-1-naphthalenyl]ethylidene]-dihydro-4-hydroxy-2(3h)-furanone:

53. A method comprising:

- i) diagnosing in a patient a disease selected from the group consisting of: Alzheimer's Disease; Acquired Immune Deficiency Syndrome; and autoimmune disease, and
- 5 ii) administering to said patient 3-[2-[decahydro-6-hydroxy-5-(hydroxymethyl)-5,ha-dimethyl-2-methylene-1-naphthalenyl]ethylidene]-dihydro-4-hydroxy-2(3h)-furanone in an amount effective to combat said disease.

Similarly, claim 66 encompasses administering 3-[2-[decahydro-6-hydroxy-5-(hydroxymethyl)-
10 5,ha-dimethyl-2-methylene-1-naphthalenyl]ethylidene]-dihydro-4-hydroxy-2(3h)-furanone to improve the patient's immune system function:

66. A method comprising:

- i) diagnosing in a patient a disease, and
- 15 ii) administering to said patient 3-[2-[decahydro-6-hydroxy-5-(hydroxymethyl)-5,ha-dimethyl-2-methylene-1-naphthalenyl]ethylidene]-dihydro-4-hydroxy-2(3h)-furanone in an amount effective to affect said patient's immune system function.

Thus, the claimed invention is directed towards the treatment of HIV / AIDS.

20 10. While not required by MANUAL OF PATENT EXAM. PROC. § 708.02 ¶ X (2001), Applicant notes that the Inventors of record have a good knowledge of the prior art. The Applicant has caused the inventors of record to make a careful and thorough search of the prior art. Copies of each of the references deemed most closely related are already of record in this case.

11. The urgency of the AIDS epidemic lends urgency to the review of the patent application,
25 which teaches a valuable addition to the tools useful to combat HIV / AIDS.

POINT TO BE REVIEWED

Whether examination of the application may be accelerated pursuant to MANUAL OF
PATENT EXAM. PROC. § 708.02 ¶ X (2001)?

5

ACTION REQUESTED

Applicant respectfully requests that examination of the application, and any continuation or
divisional application be made special.

10

ENCLOSURES

A FEE TRANSMITTAL FORM and the required petition fee are enclosed. The references cited herein are attached. The references most closely related to the claimed invention have already been made of record.

Respectfully submitted,
PHARMACEUTICAL PATENT ATTORNEYS LLC

/s/

Mark Pohl Esq., Registration No. 35,325
13 July 2005

55 Madison Avenue, 4th floor (P 4014)
Morristown, NJ 07960-6397

Direct ☎ (973) 984-0076
Mark.Pohl@LicensingLaw.Net

mbc:mp

Mbc:mp

Enclosures:

- 1) DestinationRx, Inc., PRICE COMPARISON (available at www.destinationrx.com) (11 Dec. 2002)
- 2) Philanthropic Research, Inc., *Give Me Your Hungry*, (available at www.guidestar.com) (2002)
- 3) BOOYSEN, F. le R. *et al.*, *HIV/AIDS, Poverty and Growth*, (Annual Conference of the Centre for Study of African Economics) (18 March 2002)
- 4) BOOYSEN, F. le R., *HIV/AIDS and Poverty: Evidence for a Household Impact Study* (DPRU Conference) (22 Oct. 2002) AKUKWE, Chinua, *The Need for an Urban HIV/AIDS Policy In the United States*, 12 JOURN. HEALTH & SOC. POLICY 1 (2001) (abstract only)

Price Comparison

Combivir

This medication is used to treat HIV infection, generally ...in combination with other medications. ...[Get more drug information.](#)

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Compare and Save Up To: \$202.67

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**	
 Store Info	COMBIVIR 150-300MG	180	\$1,853.98	\$3.85	3-5	\$
 Store Info	COMBIVIR 150-300MG	180	\$1,651.31	\$1.95	6-14	\$
 Store Info	COMBIVIR 150-300MG	180	\$1,699.99	\$1.49	8-10	\$

Total : 3 Results

* All pr

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** : Delivery time is calculated in business days.

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Price Comparison

Crixivan

Indinavir is a protease inhibitor type of antiviral ...medication. It may be used in combination with other drugs to ...treat human immunodeficiency virus infection (HIV). It works by ...slowing the growth of the virus. ... This drug is not a cure for HIV and does not prevent the ...passing of HIV to others. ...OTHER This medication may also be used to prevent HIV after ...coming in contact with the virus. ...[Get more drug information.](#)

Search Again:

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Compare and Save Up To: \$69.83

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
 Store Info	CRIXIVAN 400MG	270	\$736.73	\$3.85	3-5
 Store Info	CRIXIVAN 400MG	270	\$666.90	\$1.95	6-14
 Store Info	CRIXIVAN 400MG	270	\$680.51	\$1.49	8-10

Total : 3 Results

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Price Comparison

Retrovir

Zidovudine is a nucleoside reverse transcriptase inhibitor ...antiviral agent used to treat human immunodeficiency virus (HIV) ...infection. It works by slowing the growth of the virus. It is not ...a cure for HIV and does not prevent the passing of HIV to others. ... This medication is also used in pregnant women to prevent ...spreading the virus to the fetus. ...OTHER This medication may also be used to prevent HIV after ...coming in contact with the virus. ...[Get more drug information.](#)

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Compare and Save Up To: \$47.46

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
 Store Info	RETROVIR 300MG	180	\$940.25	\$3.85	3-5
 Store Info	RETROVIR 300MG	180	\$892.79	\$1.95	6-14
 Store Info	RETROVIR 300MG	180	\$911.07	\$1.49	8-10

Total : 3 Results

* All prices

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Price Comparison

Sustiva

This medication is used to treat HIV infection in ...combination with other anti-HIV medications. ...[Get more drug information.](#)

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Compare and Save Up To: \$21.99

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**	
 PRESCRIPTIONS BY MAIL.COM Store Info	SUSTIVA 600mg	90	\$1,077.38	\$1.95	6-14	\$
drugstore.com Store Info	SUSTIVA 600mg	90	\$1,099.37	\$1.49	8-10	\$

Total : 2 Results

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Price Comparison

Viracept 300

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Compare and Save Up To: \$0.00

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
 PRESCRIPTIONS BY MAIL.COM Store Info	VIRACEPT 300 250mg Tablets	3	\$1,848.12	\$1.95	6-14 \$

Total : 1 Result

* All pr

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Price Comparison

Viramune

This medication is used in the treatment of infection with ...the HIV virus (the virus that causes AIDS). It is used in ...combination with other HIV medications in selected patients. ...No cure exists for HIV infection, and the illnesses associated ...with your disease (infections, etc.) may continue. ...[Get more drug information.](#)

Search Again:

Type product name here.

Search Now!

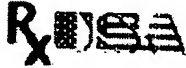


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Compare and Save Up To: \$131.24

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
 Store Info	VIRAMUNE 200MG	180	\$960.88	\$3.85	3-5
 Store Info	VIRAMUNE 200mg	180	\$829.64	\$1.95	6-14
 Store Info	VIRAMUNE 200MG	180	\$884.84	\$1.49	8-10
Total : 3 Results					

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Drug Info

Viramune

IMPORTANT NOTE:

THE FOLLOWING INFORMATION IS INTENDED TO SUPPLEMENT, NOT SUBSTITUTE FOR, THE EXPERTISE AND JUDGMENT OF YOUR PHYSICIAN, PHARMACIST OR OTHER HEALTHCARE PROFESSIONAL. IT SHOULD NOT BE CONSTRUED TO INDICATE THAT USE OF THE DRUG IS SAFE, APPROPRIATE, OR EFFECTIVE FOR YOU. CONSULT YOUR HEALTHCARE PROFESSIONAL BEFORE USING Viramune.

NEVIRAPINE ORAL (neh-VYE-ruh-peen)

COMMON BRAND NAME(S):

Viramune

WARNING:

Because HIV can quickly become resistant to this medication if used alone, nevirapine must be used with at least 1 other anti-HIV medication. Your doctor may change your treatment plan if Viramune stops working well. Nevirapine has caused severe, even fatal, liver and skin reactions (e.g., Stevens-Johnson syndrome, allergic reaction). If you develop a rash while using Viramune, stop using nevirapine and notify your doctor immediately. If you develop unusual fatigue, abdominal or stomach pain, dark urine, nausea, loss of appetite, or yellowing of the skin or eyes, seek immediate medical attention.

USES:

Viramune is used in the treatment of infection with the HIV virus (the virus that causes AIDS). It is used in combination with other HIV medications in selected patients. No cure exists for HIV infection, and the illnesses associated with your disease (infections, etc.) may continue.

HOW TO TAKE Viramune:

Take by mouth as directed. The usual dose is one 200mg tablet daily for the first 14 days, then followed by one 200mg tablet twice a day.

Nevirapine is taken with at least one other medication (antiretroviral) for HIV. It is important to follow the dosing instructions carefully in order to minimize serious side effects, such as rash. If a rash develops in the first two weeks, the nevirapine dose is not increased until the rash is gone. If treatment is stopped for more than 7 days, then re-treatment should begin with one 200mg tablet daily for 14 days, then one 200mg tablet twice a day.

SIDE EFFECTS:

Nausea or headache may occur. Notify your prescriber if these problems persist or worsen. **Notify your prescriber immediately if you experience:**

rash, itching, fever, blistering, mouth sores, pink eye (conjunctivitis), swelling, muscle/joint aches, yellowing of the skin or eyes, stomach pain, tingling/numbness of the hands or feet. If you notice other effects not listed above, contact your doctor or pharmacist.

PRECAUTIONS:

Tell your doctor your medical history, especially of:
liver or kidney disease, any allergies. Viramune should be used only when clearly needed during pregnancy. Discuss the risks and benefits with your doctor. Viramune is excreted into breast milk. Because breast milk can transmit HIV, do not breast-feed.

DRUG INTERACTIONS:

Inform your prescriber or pharmacist about all the medicines you take (prescription and nonprescription), **especially of:**
protease inhibitors (e.g., indinavir, saquinavir), terfenadine, ketoconazole, astemizole, alprazolam, triazolam, nifedipine, cyclosporine, prednisone; hydrocortisone (corticosteroids), macrolide antibiotics (e.g., azithromycin, erythromycin), rifamycins (e.g., rifabutin, rifampin), methadone,

Price Comparison

Zerit

This medication is used in combination with other ...medication(s) to treat HIV infection. ... Stavudine is not a cure for HIV and does not prevent the ...passing of HIV to others. ...[Get more drug information.](#)

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Compare and Save Up To: \$38.35

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
drugstore.com Store Info	ZERIT 40MG	100	\$488.10 [PP: \$4.88]	\$1.49	8-10
Costco.com Store Info	ZERIT 40MG	100	\$507.69 [PP: \$5.08]	Free	5-7
Eckerd.com Store Info	ZERIT 40MG	100	\$517.81 [PP: \$5.18]	Free	5-10
AARP Store Info	ZERIT 40MG	100	\$526.45 [PP: \$5.26]	\$2.25	5-10
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Price Comparison

Ziagen

This medication is used to treat HIV infection in ...combination with other anti-HIV medications. ...[Get more drug information.](#)

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Compare and Save Up To: **\$68.71**

Vendor	Product	Qty	Sort by Price	Estimated Shipping & Handling*	Sort by Delivery Time**
 Store Info	ZIAGEN 300MG	100	\$581.42 [PP: \$5.81]	\$1.49	8-10
AARP Store Info	ZIAGEN 300MG	100	\$577.90 [PP: \$5.72]	\$2.25	5-10
Costco.com Store Info	ZIAGEN 300MG	100	\$586.87 [PP: \$5.87]	Free	5-7
Eckerd.com Store Info	ZIAGEN 300MG	100	\$646.61 [PP: \$8.47]	Free	5-10
Total : 4 Results					

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Give Me Your Hungry, page 4

Affecting the Most Vulnerable

Some of society's most vulnerable individuals find themselves facing hunger. Paul Weiss, president of Children of the Americas in Washington, D.C., identifies children as one group in need. "All you have to do is ask a few questions to begin to get into the issue of the hunger of DC children AND the hunger of one out of every five U.S. children: 'If a child qualifies for free breakfast and lunch at school (75% of DC public school children do), where does that child get her/his dinner? Or afternoon snack? Or breakfast and lunch on snow days or holidays or Saturdays and Sundays or in the summer?'"

In Minneapolis, Minnesota, "The summer months ... bring ... an increased number [of] people served" by the Food Centre at House of Charity, Inc. Resource coordinator Marni Bluske explains, "This is due to children being out of school. We are proud participants of the Summer Food Program, which was developed by Department of Children, Families and Learning."

Karen Azeez, assistant director of development for City Harvest of New York City, notes that in the Big Apple, "Some 70,000 people—40% of whom are children—are turned away from soup kitchens and food pantries each month due to lack of food."

Hunger is also a fact of life for many of the nation's older citizens. Carol Nesbitt describes Storehouse West's efforts to feed the elderly in New Mexico:

One of the most important parts of our program is assistance to Senior Citizens. There are so many with such small incomes and necessary expenses such as prescriptions that food very often is the last purchase. We have two programs for Seniors—one is for those with less than \$500 ... after paying rent or mortgage. These are able to receive a box of supplemental food every month. The other program is for those Seniors [with incomes of] over \$500 but under \$800 who pick up a box every six weeks.

Illness also brings hunger into many households. A number of organizations provide food to individuals living with the HIV virus or AIDS. In Washington, D.C., Food & Friends has "a steady base of clients" who rely on the freshly prepared, nutritious meals the nonprofit delivers to their homes. Major gifts coordinator Tracy Wilking notes, "Our clients are overwhelmingly low income, so for them, we are a necessity. Through sound nutrition and nutritional counseling, we help make fighting HIV/AIDS possible for our clients."

Sandra Marinelli, projects director of The River Fund New York, reports that the organization's "involvement in supplying food to the hungry, homeless and those living with HIV/AIDS is presently experiencing a rapid increase in the demand for food. Our Street Relief Program is now actively supplying bagged lunches to the hungry twice a week at Rufus King Park, Jamaica, Queens."

Peter Massey, foundations manager of the AIDS Service Center (ASC) in Pasadena, California, emphasizes good nutrition's role in battling HIV and AIDS—and how difficult it can be for infected individuals to obtain nourishing meals:

For individuals struggling with HIV/AIDS, the maintenance of proper diet is a survival issue—both physically and economically. Since malnutrition is a common complication of HIV infection, a healthy diet can significantly bolster the immune system to resist ramifications of the disease. ... Unfortunately, only the most financially secure HIV/AIDS-impacted individuals are able to afford consistently healthy foods and nutritional supplements. High medical bills (even for the health insured) combined with a decreased ability to work renders many persons with HIV/AIDS indigent. Nearly all of ASC's clients live in poverty.

David Waters, executive director of Community Servings in Roxbury, Massachusetts, describes a similar situation:

The connection between HIV/AIDS and hunger has always been profound. The majority of Community Servings' clients (95%) are living at or below the poverty level, and are struggling to stay afloat economically while confronting drug adherence, their side effects, and the ravages of HIV infection. People living at the poverty line are already worried about where their next meal is coming from, and this problem is only exacerbated by an illness as serious and potentially debilitating as AIDS. Our meals help parents continue to care for their children, and help the many clients who live alone care for themselves.

Both Massey and Waters expect demand for their organizations' services to grow. The impact that the HIV virus and AIDS have had in the United States pales, however, in comparison to the devastation they are causing overseas.

April Allen Watson, manager of foundation and corporate relations for Freedom from Hunger in Davis, California, reports, "HIV/AIDS is threatening to undo all the progress made through international development in the past 50 years. It is being called the single greatest obstacle to overcoming poverty and hunger in Africa."

According to Anna Kar of Action Against Hunger, "hunger is one of the most effective and cheap weapons" overseas. The New York City organization sends "professional teams of nurses, agronomists, water engineers and nutritionists to the field" to "work directly with the displaced and refugee populations ... afflicted



with hunger and malnutrition caused by man-made and natural disasters."

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AIDS Service Center, Inc.

1030 South Arroyo Pky
Pasadena, CA 91105
<http://www.aidservicecenter.org>

Information in this report was supplied by the nonprofit organization more than 24 months ago.

Who We Are

AIDS Service Center (ASC) is the second largest AIDS service provider in Los Angeles County and the nation's oldest provider of services to families affected by HIV/AIDS.

Contact Info

Tel: (626) 441-8495
Fax: (626) 799-625
bgp@aidssc.org
Contact: Ms. Beth Powers,
Development and
Communications
Assistant

Program / Activities

AIDS
Family Services
Graduate, Professional(Separate
Entities)

Financial Info

Fiscal 2001
Year:
Assets: \$969,642
Income: \$4,434,725
This organization files an IRS
Form 990 or 990-EZ.

Location(s) Served

Los Angeles County, with
primary focus in the San Gabriel
Valley

It makes its audited financial
statements available to the public
upon request.
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Chief Executive:	Ms. Sue W. Scott
No. of Board Members:	25
No. of Full Time Employees:	21-100
No. of Part-Time Employees:	1-5
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Year Founded:	1988

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HIV/AIDS, Poverty and Growth: Evidence from a Household Impact Study conducted in the Free State province, South Africa¹

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University of the Free State, South Africa

Paper presented at the Annual Conference of the Centre for Study of African Economies (CSAE), St Catherine's College, Oxford, 18-19 March 2002

ABSTRACT

Households affected by HIV/AIDS bear a substantial burden of illness and death, and this is associated with more severe poverty. Many affected households rely heavily on social welfare grants, which imply that government will in future years be faced with increasing claims. Affected households also spend less on food than non-affected households. In the longer run, this may contribute to malnutrition, which means that it will be particularly important to investigate policy programs that can enhance the food security of affected households. The utilizing of savings and new borrowing appears to be a common strategy employed by affected households to cope with illness and particularly with a death in the household. The amount of savings utilized and money borrowed by affected households in the recent past are considerable. Hence, illness and death appear to put considerably strain on household finances. The danger of course in the longer run is that these actions will move households deeper into poverty as more resources are crowded out in favor of debt repayments in the absence of improvements in household income. Access to medical aid has been shown to be the single most important predictor of poverty status. This may suggest that wider access to affordable medical aid with certain minimum benefits and/or the introduction of a broad-based basic income grant or social security system offering minimal support may be important in mitigating the impact of the epidemic. Continued efforts at poverty reduction will therefore remain crucial, particularly insofar as education and employment has also been shown to offer protection to affected households having to cope with illness and death.

¹ This research paper is sponsored by USAID and administered by the Joint Center for Political and Economic Studies Inc. under a subcontract agreement from Nathan Associates Inc.

BACKGROUND AND PROBLEM STATEMENT

The HIV/AIDS epidemic poses a severe threat to the economies of developing countries, and those on the African continent in particular. South Africa, which is being affected fundamentally by the epidemic, is no exception. By the end of 1997 2,8 million people in South Africa were estimated to be living with HIV/AIDS. By 1999, this figure had increased to 3.5 million. The estimated prevalence of HIV/AIDS among the country's adult population (11.8%) is amongst the highest in the world (ILO, 2000). According to the Metropolitan-Doyle model, the number of South African living with HIV/AIDS will increase from 160 000 to almost one million between 2000 and 2010. The annual number of AIDS deaths is estimated to increase from 120 000 to between 545 and 635 thousand between 2000 and 2010 (Abt Associates, 2000: 8-9). The number of children younger than fifteen years orphaned by AIDS has been estimated to be 800 000 by 2005, rising to more than 1.95 million by 2010 (Abt Associates, 2000: 11). These infected individuals and affected children all belong to individual households and their deaths will have a significant impact on their families. Hence, the epidemic will have a considerably impact on households in South Africa.

Over the next ten to fifteen years, the epidemic has the potential to erode development gains made in past decades. As the disease takes its toll on the economically active population, production and demand are expected to decline, which will slow down economic growth and development. The disease will also have serious budgetary implications in terms of increased government expenditure on health care and social security, which will be aggravated by the decline in government revenue due to declining economic activity (Barnett and Whiteside, 1998; ILO, 2000).

Research into the socio-economic impact of HIV/AIDS on households and communities is crucial in guiding current and future policies and intervention strategies intended to absorb this impact. From an economic point of view, the primary impact of the disease manifests mainly among individual economic agents, i.e. individuals and households. An assessment of the socio-economic of HIV/AIDS would therefore have to start on this micro-level of analysis. To date no comprehensive, longitudinal study of the impact of HIV/AIDS on such a micro-level

of analysis has been conducted in South Africa. The likes of Arndt and Lewis (2000) have conducted an analysis of the macroeconomic implications of HIV/AIDS for South Africa. They estimate that the maximum differential between GDP growth rates over the period 1997-2010 will be 2.6 percentage points. Other country and cross-country studies on the macroeconomic impact of HIV/AIDS in Africa estimates the reduction in average GDP growth rates at between 0.3 and 4 percentage points (Dixon *et al.*, 2002: 233). Yet, these macroeconomic models often fails to allow for the effects of a number of important microeconomic impacts which are endogenous to such model, amongst others that of asset sales and investments in human capital. This failure to a large extent derives from the lack of household level economic data with which to quantify these assumptions. Work on the macroeconomic model maintained by the Department of Finance faces similar constraints (Compernelle, 2000), as do macroeconomic models maintained by other consultancies. Hence, one aim of this research project is to inform economic growth analyses and studies on the macroeconomic impact of HIV/AIDS. This paper presents the main findings from the cross-section analysis of the data from the first panel that are important in achieving the former objective, as well as those findings that are important in explaining why poverty in combination with the HIV/AIDS epidemic seems to represent a major threat to the livelihood of households.

METHOD

The impact of HIV/AIDS on individuals and households was assessed by means of a cohort study of households affected by the disease, and compared with a control group of households unaffected by the disease. For this purpose, a six-monthly survey on the quality of life and the economics of affected and non-affected households was conducted. Interviews were conducted with one respondent only, namely the "person responsible for the daily organization of the household, including household finances". The survey was conducted in two local communities in the Free State province, one urban (Welkom) and one rural (QwaQwa), in which the HIV/AIDS epidemic is particularly rife. The results reported in this paper are based on a cross-section analysis of the data collected during the first phase of the project.

PROFILE OF SAMPLE POPULATION

Although the sample in certain instances closely reflects the socioeconomic profile of the national population (e.g. male/female distribution of the population), it in most cases differs distinctly from the general South African population. The profile of the sample of households included in this study can largely be attributed to the sampling design. Given that affected households were sampled from networks and/or organizations involved in counseling, home-based care and public health care and mainly in poorer communities, the sample does not include affected households that mainly utilize private health care services. Moreover, the study was conducted in one specific province (Free State) and in two selected sites only. However, the fact that South Africa's poor, predominantly African population face relatively high HIV prevalence rates and are particularly vulnerable to the epidemic and therefore dependent on support from the public service sphere, means that the findings and policy recommendations put forward in this paper are especially relevant to informing government's responses to HIV/AIDS, although it is only partly informative with regard to the implications of HIV/AIDS for poverty and growth.

KEY CONCEPTS FOR COMPARATIVE ANALYSIS

The results presented in the subsequent pages draw comparisons between households in terms of four stratifications of the data. These concepts and terminology can be defined as follows.

- **URBAN** versus **RURAL** comparisons: This refers to the distinction between households living in Welkom and households living in QwaQwa. Welkom is a relatively large urban settlement in the Goldfields in the Eastern Free State. QwaQwa is a former homeland, which is still governed mainly by traditional leadership in an area where communities reside in 42 smaller villages. The distinction therefore between urban/rural is based on the nature of governance structures in the two areas rather than the physical housing infrastructure characteristic of these areas. In QwaQwa, for example, the majority of the population resides in formal dwellings, yet the community remains a predominantly rural one.

- **AFFECTED** versus **NON-AFFECTED** comparisons: This refers to the distinction between interviewed households in which at least one person is known to be HIV-positive as opposed to interviewed households residing in close proximity in the affected households which was sampled as controls. The former households were recruited purposively from established networks and/or organizations in the two areas involved in HIV/AIDS. In the case of the latter households no one in these households is known to be HIV-positive insofar as testing could not be conducted, nor was any member of these households presently treated for tuberculosis or hospitalized for pneumonia in the month before the interview.
- **ILLNESS** versus **NO ILLNESS** comparisons: This refers to the distinction between households in which one or more members had been continuously ill in the month preceding the interview as opposed to households where no member had been continuously ill in the month preceding the interview.
- **DEATH** versus **NO DEATH** comparisons: This refers to the distinction between households in which one or more members had died in the six month preceding the interview as opposed to households where this was not the case.

STATISTICAL METHODS

Proportions of households (or household members) were compared between affected and unaffected households, and between Welkom and QwaQwa, using Pearson χ^2 or exact tests. Outcomes were where possible compared at both individual and household levels. Multiple logistic regression analysis was used to determine the independent influences of certain explanatory variables on selected outcomes related to morbidity, mortality and the socioeconomic impact of HIV/AIDS, adjusting for influential personal, household and area characteristics. Variables were retained in each model if they significantly improved the respective model. Logistic regression models with individual level outcomes were adjusted for clustering of outcomes at household level, using Stata statistical software. Intra-household correlation of each outcome was expressed as an intra-cluster correlation coefficient (ICC). The ICC is

the proportion of variance in the outcome accounted for by inter-household differences. Statistical significance was defined at the 5% level.

RESULTS

BURDEN OF ILLNESS AND DEATH

A comparison of the age of members of affected and non-affected households who were ill during the past month (Figures 1) shows that ill individuals in affected households were more likely to be between about 20 and 40 – the age band most at risk of HIV/AIDS. Similar age distributions were seen when those with and without diagnoses of infectious disease were compared.

Figure 1: Age of ill individuals in affected and non-affected households

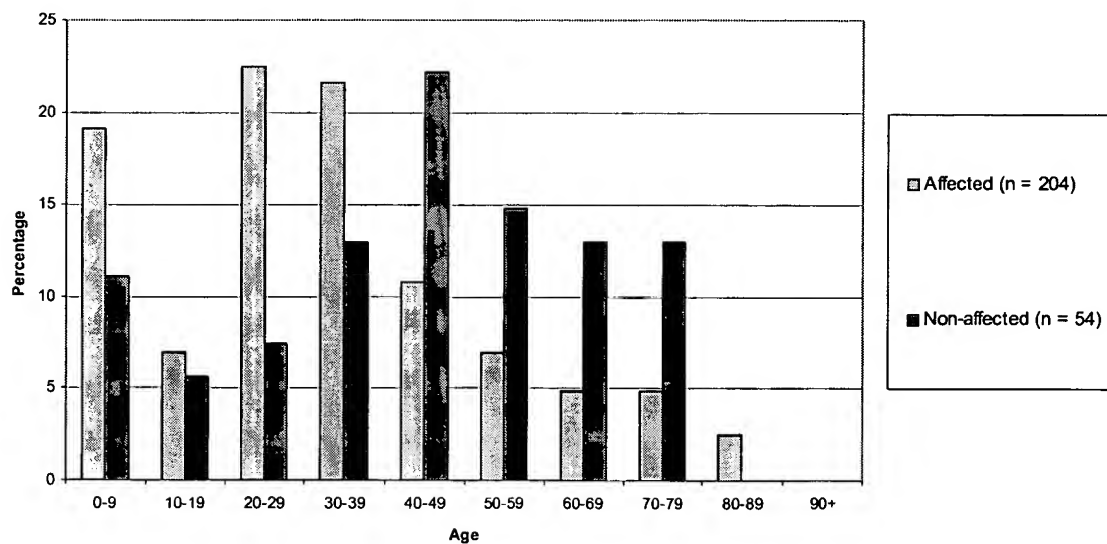


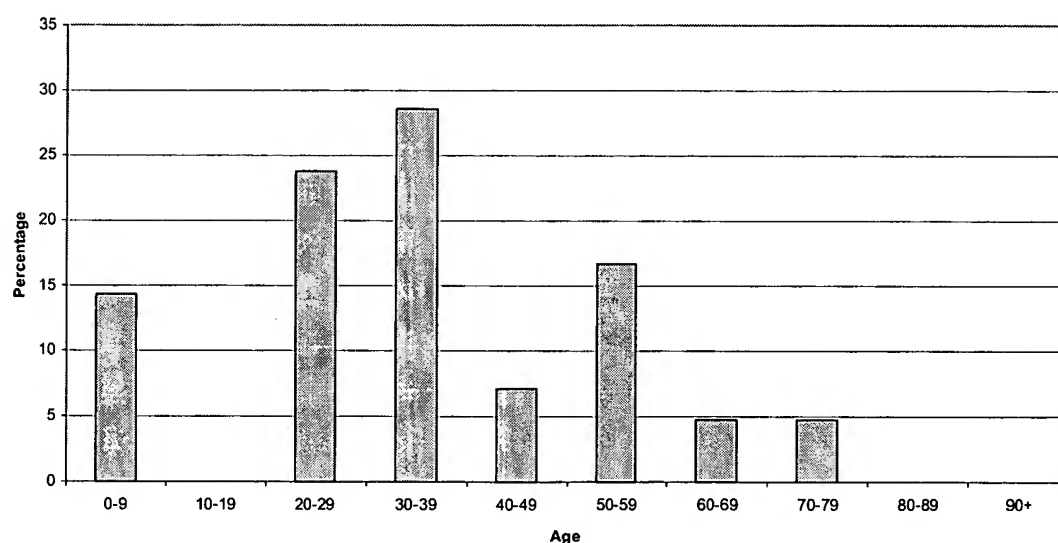
Table 1 shows that the risk of illness was significantly higher in affected households in all age bands up to 50 years, and the odds ratio was highest in the age bands 5-10 years (OR=13) and 20-30 years (OR=11). The low P value for the age*affected status interaction term shows that age significantly modified the effect of HIV on risk of illness.

Table 1: Risk of illness in affected versus unaffected households by age band

Age band (years)	Number of persons in band	Odds ratio*	95% confidence interval
0 - <5	185	4.6	(1.7-12.5)
≥ 5 - <10	213	13.1	(1.7-101)
≥ 10- <20	454	4.7	(1.4-16.6)
≥ 20- <30	363	11.4	(4.0-32.4)
≥ 30- <40	268	6.4	(2.9-14.2)
≥ 40- <50	174	2.8	(1.3-6.2)
≥ 50- <60	110	1.9	(0.74-5.0)
≥ 60	138	1.5	(0.71-3.3)

* Log ratio value for inclusion of age*affected status interaction term in logistic regression model: P = 0.006.

The mean age of death was 35 (range 0-73, inter-quartile range 24-49) years. The following graph of the age distribution of deaths shows a peak around 35 years, again emphasizing the impact of HIV/AIDS on the supply of household labor (Figure 2).

Figure 2: Age at death for deaths occurring in affected households (n=42)

72% (182/253) of ill household members were cared for at home, the rest being hospitalized or ambulatory. Indicators of the burden on households are shown in Table 2. Being cared for at home was slightly more likely among those from affected households (75%) than from unaffected households (62%) households. The duration of being cared for at home appeared higher in affected households (median 20) than unaffected households (median 14), but this difference was not significant. Among the 177 for whom the logistical burden of home care was reported, caring for the ill person took a median of 4 hours per day. This took longer in affected households

(median 4) than in unaffected households (median 3) ($P=0.06$). Someone else accompanied almost 60% of ill household members that attended health services. Those from affected households were significantly more likely (68%) to be accompanied than those from unaffected households (37%).

Table 2: Caring for an ill household member at home

	Total	Affected	Unaffected	P*
Cared for at home. <i>n/N (%)</i>	182/253 (72)	149/200 (75)	33/53 (62)	0.08
Among those cared for at home:				
• Days of home care. <i>Median [range]</i>	19 [2-31]	20 [2-31]	14 [2-31]	0.43
• Hours per day caring for ill person. <i>Median [range]</i>	4 [1-24]	4 [1-24]	3 [2-12]	0.06
Accompanied ill person to health service. <i>n/N (%)</i>	151/256 (59)	131/192 (68)	20/54 (37)	<0.001

* Exact test for proportions, Wilcoxin ranksum test for medians.

Caring for an ill person led their caregivers to lose income in 5% (9/180) of cases; this percentage did not differ between affected and unaffected individuals ($P=1.0$). Among these 9 caregivers, the median number of working days lost over the past month was 7 (range 1-30). Carers came from outside the household in 12/83 (6.5%) cases. Only 5% (7/149) of those accompanying ill household members to health services lost income as a result, and this did not differ between affected and unaffected households ($P=1.0$).

The logistical burden of caring for the deceased during their fatal illness was as follows. Household members spent an average of 7.5 (range 2-24) hours per days providing care. In rural Zimbabwe, Woelk *et al.* (1996, as quoted in Topouzis, 2000) found the average time spent in caring for a bed-bound patient to be 38.5 hours per week, which nearly represents full-time employment. Thus, illness and death do exert considerable pressures on the supply of household labor in terms of the burden of caring, yet the direct economic cost of this loss of time appears to be low due to relatively high levels of unemployment in the sample population. Loss of income due to caring was however reported for only 2 (5% of 38) households. Care appeared to be provided mainly by unemployed household members: an average of 5 (range 2-10) working days was lost caring for them during the months before their death. Carers

were almost always relatives. This burden of care often falls heavily on female members of households, who normally care for the ill and their orphaned children, evidence of which was found in Uganda (UNDP, 1998).

LABOR SUPPLY: HOUSEHOLD SIZE AND STRUCTURE

AIDS deaths, which follow on AIDS morbidity, leads to a more permanent cutback in the labor supply of affected households, decreasing the future earning potential of the household (Bollinger and Stover, 1999a; Topouzis, 2000). Other impact studies have quantified this loss in terms of differences in household size, household structure and dependency ratios, which reflect changes in the composition of affected households.

Table 3: Supply of household labor and unemployment

	Welkom Affected	Welkom Non- affected	QwaQwa Affected	QwaQwa Non- affected	Total	Total Affected	Total Non- Affected	P
Average household size	5.6	4.6	4.5	4.1	4.7	5.1	4.3	0.002
Dependency ratio	36.5	32.0	34.3	34.0	34.2	35.4	33.0	0.310
Sample size (n)	101	100	101	104	406	202	204	

Affected households on average are slightly larger than non-affected household (Table 3). This suggests that affected households may in fact have a larger available supply of labor than non-affected households. However, the dependency ratio in affected households is higher than that in non-affected households, implying that households affected by HIV/AIDS in fact have a smaller supply of labor than non-affected households, with a larger proportion of the household consisting of children and elderly persons. These differences, though, are not statistically significant. The Kagera (Tanzania) and Rakai (Uganda) household impact studies, for example, reported marginal changes in dependency within households. The dependency ratio, which was 1.2 before the death of an adult, respectively increased to 1.4 (Kagera) and 1.5 (Rakai) following the death (Topouzis, 2000: 9). In rural Chiangmai in Thailand evidence has also been found of increasing dependency ratios. Households suffering an AIDS-death consist of 15% children younger than fourteen years and 25% elderly people, with the remainder being of prime working age. The percentage of elderly in households suffering AIDS-deaths were found to be higher and that of members of

prime working age lower than in households suffering non-AIDS deaths (UNAIDS, 1995; Wattana, 1996, as quoted in Parker *et al.*, 2000: 44; Janjaroen, 1998).

INCOME

Affected households are poorer than non-affected households, regardless of whether income is measured at the household or individual level or in adult equivalent terms (Table 4)². The fact that affected households is generally larger than non-affected households means that less resources are being shared amongst a larger number of persons. Per capita and adult equivalent income in affected households represents only between 50% and 60% of the levels of income in non-affected households.

Table 4: Income and composition of income

	Welkom Affected	Welkom Non- affected	QwaQwa Affected	QwaQwa Non- affected	Total	Total Affected	Total Non- Affected	P
Average monthly household income (Rands)	1630	2692	948	1596	1727	1296	2147	0.001
Average monthly per capita income (Rands)	335	741	232	417	434	285	580	<0.001
Average monthly adult equivalent income (Rands)	614	1211	397	694	734	508	954	<0.001
Sample size (n)	99	100	95	99	393	194	199	
Composition of income (%):								
Employment income	58.4	67.4	31.1	41.4	49.8	45.0	54.5	0.040
Non-employment income	33.9	24.7	40.9	30.8	32.4	37.3	27.7	0.022
Remittance income	7.6	7.8	21.7	25.4	15.5	14.5	16.5	0.532
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Note: The sample sizes differ from the interviewed samples in Table 1 because data were not available for all households.

Elsewhere, households living in rural Chanyanya in the Kafue district in Zambia that were affected by chronic illness was found to have an annual income 46% lower than households in the same area that were not affected by chronic illness (Mutangadura and Webb, 1999, as quoted in Topouzis, 2000: 18). Households in rural Thailand affected by an adult death saw household income drop by 70.7%, while total

² Estimates of household income and expenditure were adjusted for differences in household size by dividing total monthly income and expenditure by n^α , where n represents the number of household members and α an adjustment for household economies of scale (Filmer and Pritchett, 1998: 13). According to Lanjouw and Ravallion (1995) and Drèze and Sen (1997), a α coefficient of 0.6 represents an adequately robust and reliable adjustment for household economies of scale.

per capita income dropped by 68.4% (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44). A study in the Ivory Coast reported that the household income of affected families was found to be half that of total average household income (Bechu, 1998, as quoted in Desmond *et al.*, 2000: 5).

There are also significant differences in the composition of household income. Affected households are more dependent on non-employment sources of income (which consists primarily of government grants but also amongst others includes the value of own produce consumed by the household), while a smaller proportion of their income consists on employment income. This is understandable given that affected households face higher dependency ratios, are more subject to morbidity and mortality and face higher unemployment levels. Differences between affected and non-affected households in the share of income originating from remittances are not that pronounced, although it is evident that households in QwaQwa are much more dependent on remittances than households in Welkom. Remittances make up between 20% and 25% of household income in QwaQwa.

EXPENDITURE

As in the case of income, affected households are also poorer than non-affected households when expenditure is used a measure of socio-economic status (Table 5), regardless of whether average monthly household expenditure is aggregate, per capita or adult equivalent terms. Although differences are not that pronounced in terms of total household expenditure, the fact that affected households are larger means that per capita and adult equivalent expenditure is between 60% and 70% of the levels of expenditure in non-affected households. It is also important to look at differences in expenditure on food, particularly insofar as lower levels of expenditure may impact negatively on the nutritional status of household members. In this study, affected households here spent less on food than non-affected households, with per capita and adult equivalent levels of expenditure on food representing between 70% and 80% of the levels of expenditure in non-affected households. In the longer run, this may contribute to malnutrition.

Table 5: Expenditure and expenditure patterns

	Welkom Affected	Welkom Non- affected	QwaQwa Affected	QwaQwa Non- affected	Total	Total Affected	Total Non- Affected	P
Average monthly household expenditure (Rands)	1178	1414	627	968	1045	900	1187	0.035
Average monthly per capita expenditure (Rands)	244	373	157	266	260	200	319	<0.001
Average monthly adult equivalent expenditure (Rands)	445	619	264	435	440	354	525	0.002
<i>Sample size (n)</i>	99	100	101	104	404	200	204	
Average food expenditure								
Average monthly food expenditure (Rands)	392	412	248	315	341	320	362	0.098
Average monthly per capita food expenditure (Rands)	80	104	63	92	85	71	98	<0.001
Average monthly adult equivalent food expenditure (Rands)	146	175	106	146	143	126	160	0.001
<i>Sample size (n)</i>	97	99	98	103	397	195	202	

Note: The sample sizes differ from the interviewed samples in Table 1 because data were not available for all households.

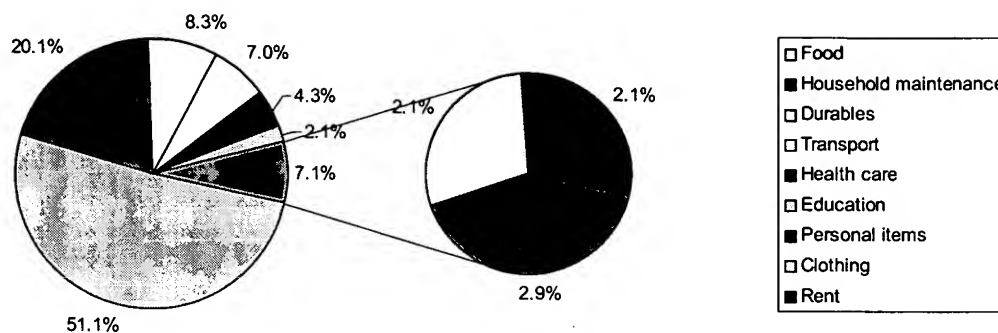
The impact of HIV/AIDS on nutritional status has been explored extensively in the household impact study the World Bank conducted in Tanzania. Here, increased consumption on health care and burials saw per capita food consumption drop by 16% amongst the poorest half of households affected by an adult death (Over, 1998: 10; Lundberg, *et al.*, 2000). Stunting amongst AIDS orphans was higher than amongst other children (Lundberg and Over, 2000). Ainsworth and Dayton (2000) investigate the impact of adult deaths on the nutritional status of the elderly members of household, using body-mass-index (BMI) as an indicator of nutritional status. They report that adult deaths have no significant impact on the BMI of the elderly. In another research paper, Ainsworth and Semali (2000) investigate the impact of adult deaths on the health status of children aged under five, employing three measures of child health, namely child morbidity, and the two common measures of stunting and wasting, namely height-for-age and weight-for-height. They report that children in poorer households are the hardest hit by adult deaths (Ainsworth and Semali, 2000).

Equally important in terms of understanding the impact of HIV/AIDS on the economy are differences in expenditure patterns. Increased spending on medical care and

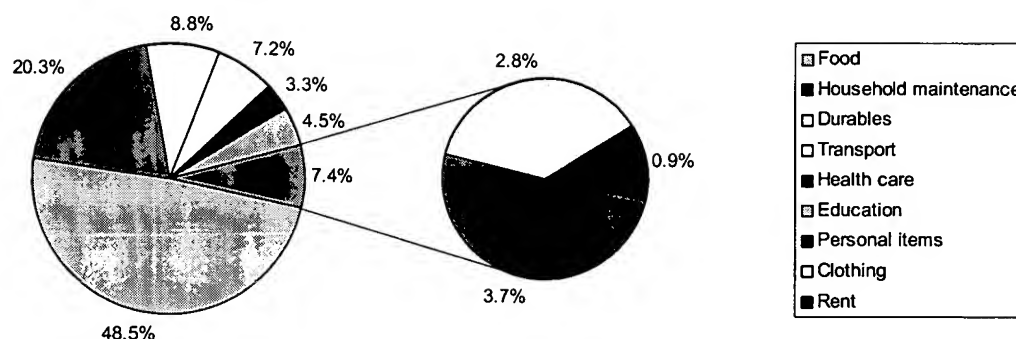
funerals crowds out other household expenditure, which may see a drop in expenditure on food and other basic needs. In Rwanda, for example, 73%, 82%, 86% and 57% of affected households could respectively not meet their clothing, housing, education and nutritional needs or could only do so with difficulty (Nandakumar *et al.*, 2000: 9). The death of an adult female in Zimbabwean households caused the consumption of most food items to decrease, with the drop in consumption being particularly pronounced in the case of meat, bread, milk and eggs (Mutangandura, 2000). In Kagera, the expenditure on food by the poorest half of households affected by an adult death fell by 32% in the short term (Lundberg *et al.*, 2000). The share of total expenditure that households in Kagera district in Tanzania that were affected by an adult death spent on food and non-food items such as clothing were 16%, which is considerably lower than the 26% spent on it by non-affected households (Lundberg and Over, 2000). The following differences can be observed in the composition of regular monthly expenditure of the households included in this study (Figure 3). Affected households, in terms of the composition of household expenditure, allocate relatively MORE of their resources to food, health care and rent and LESS to education, clothing, personal items and durables when compared to non-affected households. Differences in the share of expenditure allocated to household maintenance and transport are relatively small and may not indicate significant differences in patterns of expenditure. Other impact studies have made similar findings. In the Ivory Coast, households with AIDS patients spent twice as much on health care as households without AIDS patients (Bechu, 1998, as quoted in Bollinger and Stover, 1999b: 2). In Kagera, the share of total expenditure that households affected by an adult death on average spent on medical care and funerals respectively amounted to 16% and 5.4%, compared to 2.6% and 0.6% in households without adult deaths (Lundberg and Over, 2000).

Figure 3: Composition of regular household expenditure

(a) Affected households



(b) Non-affected households



SAVINGS, DEBT AND REPAYMENT OF DEBT

In order to understand the financial responses of affected and non-affected households to changes in households economics, which is discussed in the subsequent pages, it is necessary to look at differences between affected and non-affected households in terms of current levels of savings, debt and repayment of debt.

Table 6: Savings, debt and repayment of debt

	Welkom Affected	Welkom Non- affected	QwaQwa Affected	QwaQwa Non- affected	Total	Total Affected	Total Non- Affected	P
Savings								
Average monthly household savings (Rands)	244	389	195	360	305	219	375	0.009
Sample size (n)	46	61	51	57	215	97	118	
Debt								
Average total household debt (Rands)	7374	15103	3355	3906	6780	5141	8448	
Sample size (n)	48	43	60	63	214	108	106	
Repayment of debt								
Average monthly household repayment of debt (Rands)	538	635	295	363	460	424	497	
Sample size (n)	50	45	44	46	185	94	91	

Note: The sample sizes differ from the interviewed samples in Table 1 because data were not available for all households.

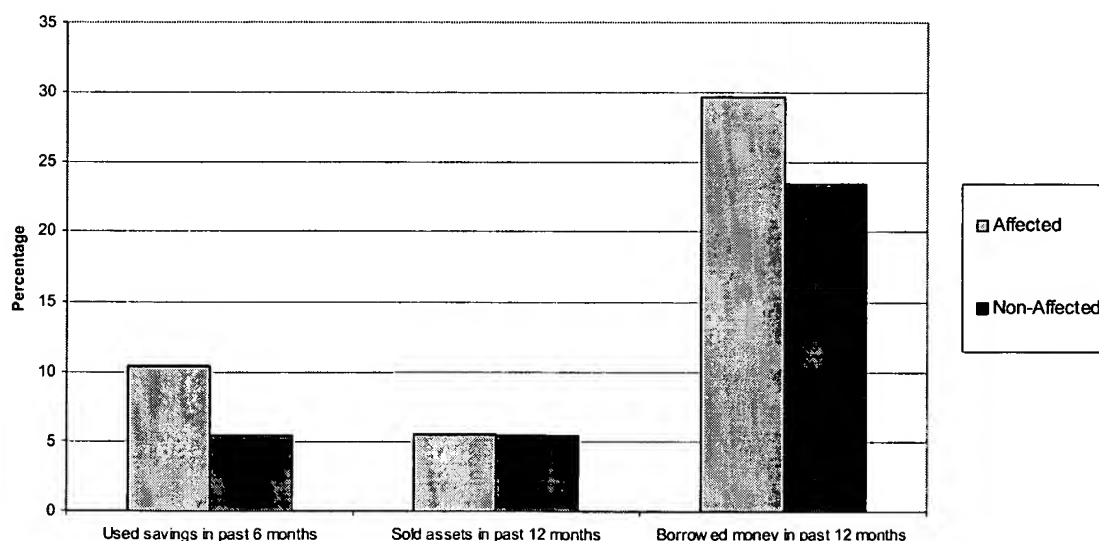
Affected households save approximately 40% less than non-affected households on a monthly basis (Table 6). This is understandable insofar as affected households generally face higher unemployment burdens, have to divide household resources between a larger number of people, and also have to face illness and morbidity which requires yet further expenditure on health care and funerals. Non-affected households have considerably higher levels of current debt than non-affected households, which is understandable insofar as higher levels of income makes it possible for these households to borrow larger sums of money. However, there is no considerable difference between the monthly repayment of debt by affected and non-affected households, which means that the servicing of current debt puts a relative larger burden on affected than non-affected households, given their lower levels of income. This implies that affected households may in the longer run have little scope to utilize savings to cope with illness and morbidity, while borrowing to cope may push them even deeper into poverty.

COPING WITH CHANGES IN INCOME AND EXPENDITURE

Households generally have three alternatives in terms of coping with changes in income and expenditure, i.e. to borrow, to utilize savings, or to sell assets. According

to evidence from other household impact studies, affected households appear to first deplete their savings and assets before they borrow money in order to cope with the financial pressures described in the previous pages. Rural households in Thailand that were affected by an adult death first tried to cope with increased medical care expenses by employing their savings, after which they considered borrowing (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44). In the subsequent paragraphs the differences between affected and non-affected households in terms of these financial responses are explored. The most frequent responses seem to be borrowing, followed by the utilization of savings and the sale of assets (Figure 4). This makes sense when considering that the households included in the sample are primarily poorer households with few assets and low income, which explains why a relatively small percentage of households utilized savings or sold assets.

Figure 4: Percentage of households that utilized savings, sold an asset, and borrowed in recent past



Note: The percentages of households utilizing savings, borrowing money or selling assets were calculated across the entire sample.

Households were also asked whether they received a lump-sum payment or inheritance following the death, which would make it possible for households to cope better with the effect of this death on household finances. However, only in 7% of cases (3/42 deaths) did affected households where a death had occurred indicate that they had received a lump-sum payment following the death. This is understandable

insofar as very few of the deceased actually was employed prior to their death and that most belong to poor households, which lessens the possibility of these persons benefiting from life insurance and/or employment benefits. Household received an inheritance following the death of the person in the case of 17% of deaths in affected households (7/42 deaths). However, the inheritance in most cases consisted of clothing and other belongings of the deceased. Even where money was inherited it was also of fairly low value, which means that it for the affected households in this sample present a relatively unimportant opportunity for coping with the impact of mortality. This may also explain why a relatively large proportion of households had to borrow, utilize savings or sell assets to cope with the changes in income and expenditure.

(i) New borrowing

Adams *et al.* (1996) report that in both of the villages sampled in the Burkina Faso study, it was customary to take loans. Romano *et al.* (1996) found that affected households in the Philippines borrowed money from lending institutions and 'loan sharks' to finance medical costs. In rural Thailand, the average per capita value of the loan and debt that households took on to cope with the impact of an adult death on household finances respectively amounted to 28.4% and 118% of per capita household income (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44), with 24% of these households borrowing from a revolving fund or cooperative (Pitayanon *et al.*, 1997, as quoted in Desmond *et al.*, 2000: 12). In Rwanda, 18% of affected households had to resort to borrowing in order to finance health care expenses, of which 64% borrowed from friends or neighbors and 16% from family (Nandakumar *et al.*, 2000). In Kagera, however, households affected by adult deaths made limited use of credit (Lundberg and Over, 2000), perhaps because households lacked access to credit facilities and/or because households prefer to adopt alternative coping mechanisms. In this study, a slightly larger number of non-affected households have borrowed money in the twelve months prior to the survey compared to non-affected households (29.7% versus 23.5%)(Table 7). 72% and 25% of the affected household that borrowed money were respectively affected by illness and death, with only 25% and 2% of non-affected households respectively being affected by illness and death.

Table 7: Role of borrowing in risk management

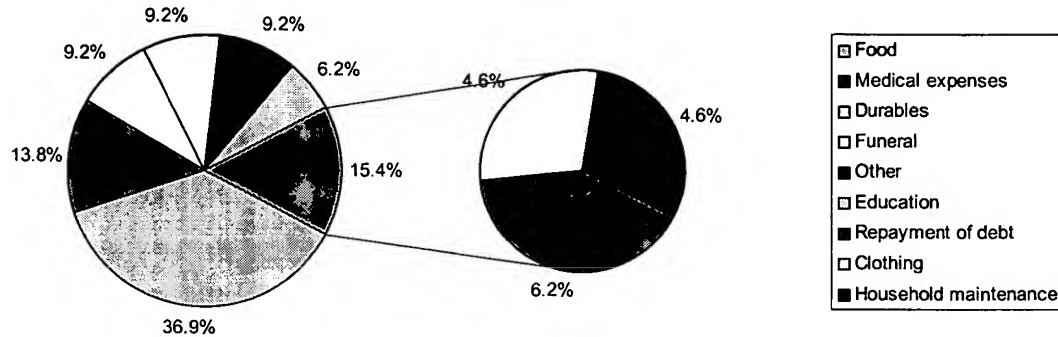
	Welkom Affected		Welkom Non- affected		QwaQwa Affected		QwaQwa Non- affected		Total		Total Affected		Total Non- Affected		P
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
No Total	101	100	100	100	101	100	104	100	406	100	202	100	204	100	<0.001
Borrowed money in past 12 months	19	19	17	17	41	41	31	3	108	27	60	30	48	24	<0.001
- <i>Affected by illness</i>	12	63	3	18	31	76	9	29	55	51	43	72	12	25	<0.001
- <i>Affected by death</i>	5	26	0	0	10	24	1	3	16	15	15	25	1	2	
Sum borrowed relative to income and debt:															
Average amount borrowed (Rands)	3082		2623		581		713		1380		1373		1389		
- <i>% of average annual household income</i>	15.3		11.6		20.7		6.9		14.2		18.9		8.5		
- <i>% of current total debt</i>	48.2		68.2		63.7		71.0		64.2		59.2		70.1		

The purpose for which the households borrowed this money also suggests that the HIV/AIDS epidemic do play a role in causing household to take on increasing levels of debt (Figure 5). A larger proportion of responses by affected households indicated that the money was used to pay for funerals and medical expenses, whereas a larger proportion of non-affected households indicated that the money was used to pay for education, durables and clothing. Similar differences were uncovered in the comparison of regular expenditure patterns in affected and non-affected households.

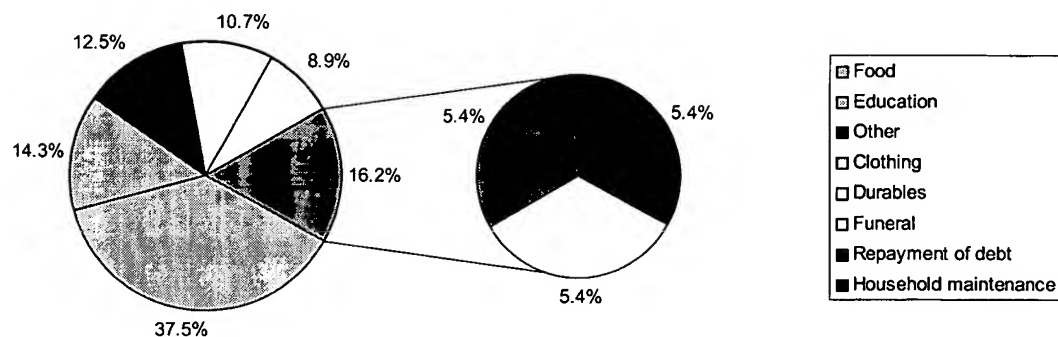
The relatively high percentage of both affected and non-affected households that indicated that the money was required to pay for food also indicates that borrowing is a common way for households caught up in poverty to survive, with poverty and unemployment being relatively high in both communities. The danger of course in the longer run is that this will move households deeper into poverty as more resources are crowded out in favor of debt repayments in the absence of improvements in household income. The reality of this threat is clear when looking at the amount of money borrowed relative to the total current debt of these households. New borrowing on average represents 64% of current debt, with the respective percentages for the affected and non-affected groups of households being 59.1% and 70.1% (Table 5). This may be particularly devastating for households affected by illness and death caused by HIV/AIDS who also have to cope with medical expenses and funeral costs.

Figure 5: Purpose for which households borrowed money

(a) Affected households



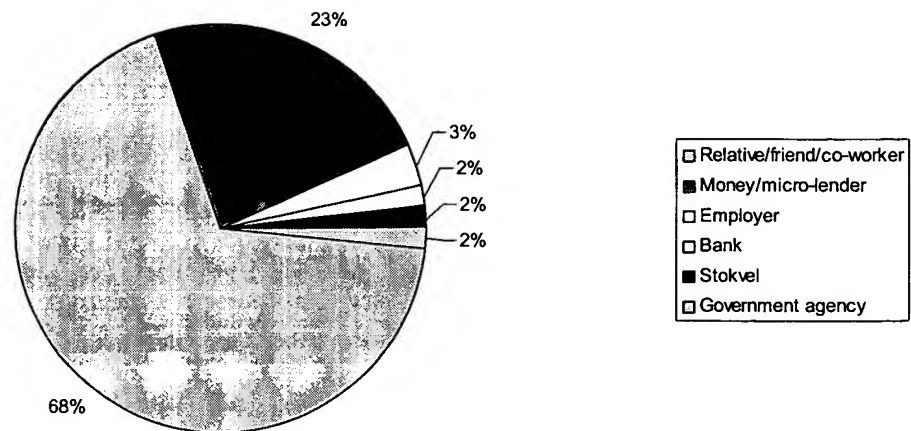
(b) Non-affected households



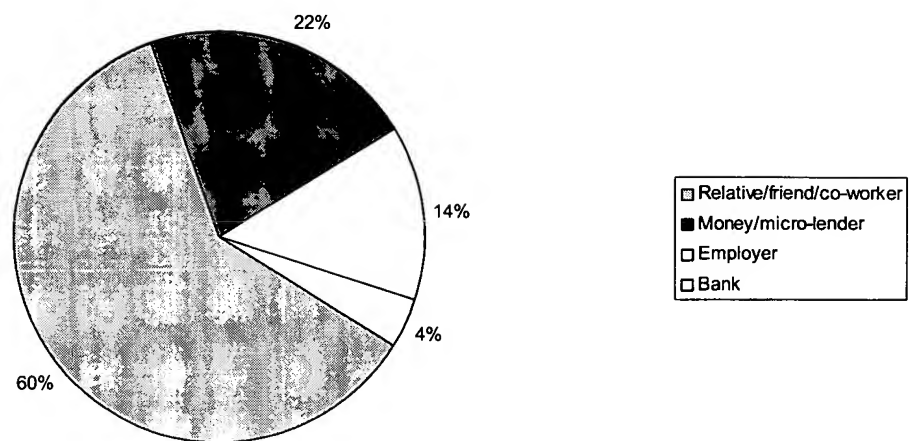
In more than 60% of cases money was borrowed from relatives and friends, while just more 20% of loans were obtained from money- or micro-lenders (Figure 6). This was the case in both affected and non-affected households. In the case of non-affected households, who generally face lower levels of unemployment, a considerably larger share of households borrowed from their employer compared to affected households.

Figure 6: Source of borrowing

(a) Affected households



(b) Non-affected households



(ii) Utilization of savings

A common strategy that affected household employ in coping with HIV/AIDS is to utilize available savings. Adams *et al.* (1996) found in Burkina Faso that most households in their study used any available cash or savings to pay for medical expenses. In the Rakai district in Uganda, affected household employed most of their savings to pay for health care and funerals (Menon *et al.*, 1998, as quoted in Bollinger

and Stover, 1999b: 2), while 60% of rural household in Thailand that had experienced an adult death used their savings to finance their medical care costs (Pitayanon *et al.*, 1997, as quoted in Desmond *et al.*, 2000: 12). In this study, just more than 50% of households indicated that they are currently saving, with a larger percentage of households in non-affected households (58%) currently saving than was the case in affected households (48%)(Table 8). A larger percentage of affected households (11%) have in the six months prior to the interview utilized savings than was the case in non-affected households (5%).

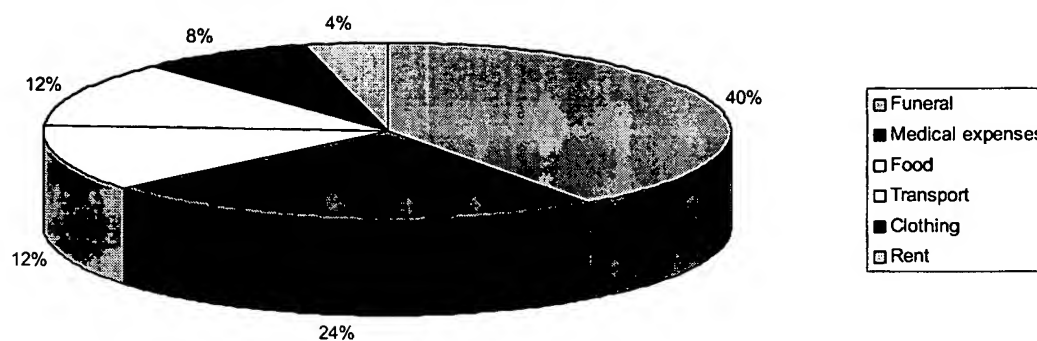
Table 8: Role of savings in risk management among household that utilized savings

	Welkom Affected		Welkom Non- affected		QwaQwa Affected		QwaQwa Non- affected		Total		Total Affected		Total Non- Affected		P
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Total no	101	100	100	100	101	100	104	100	406	100	202	100	204	100	
No currently saving	46	46	61	61	51	50	57	55	215	53	97	48	118	58	
No used savings	11	11	6	6	10	10	5	5	32	8	21	10	11	5	<0.001
- Affected by illness	8	78	1	17	8	80	0	0	17	53	16	76	1	9	<0.001
- Affected by death	5	46	0	0	5	50	0	0	10	31	10	48	0	0	
Sum used relative to current savings and average income:															
Average amount of saving used (Rands)	2247		808		5172		3020		3037		3710		1814		
- No. of months of current savings used	20		4		22		6		15		21		5		
- % of average annual household income	14.8		3.7		18.7		8.9		13.1		16.7		5.8		

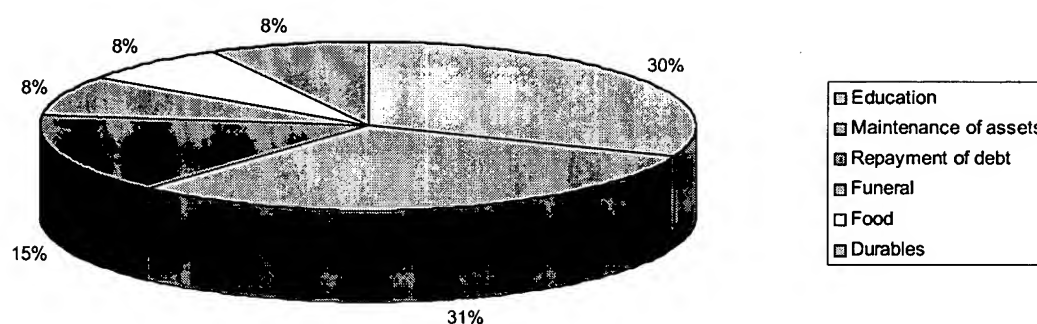
When looking at the percentage of households that utilized savings that were affected by morbidity and mortality and the use made of these savings, it is evident that HIV/AIDS plays an important role in causing affected households to utilize savings. 76% and 48% of households that utilized savings were respectively affected by illness or by death, compared to 9% and 0% of non-affected households.

Figure 7: Purpose for which households utilized savings

(a) Affected households



(b) Non-affected households



The two purposes for utilizing savings cited most often by affected households were to pay for funerals (40% of responses) and medical expenses (24% of responses), followed by food and transport (each with 12% of responses)(Figure 7). In non-affected households in turn the most often cited reasons for utilizing savings were to pay for education and the maintenance of houses and vehicles (30.8% of responses each).

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The magnitude of dissaving is considerable, particularly when looking at the amount used relative to the average current level of monthly saving of these households. Affected households on average utilized twenty-one months of savings, whereas non-affected household only utilized five months of current savings (Table 8). This differential is not that pronounced when comparing households affected and not affected by morbidity, but are even more pronounced when looking at households that have been affected by mortality. Households in which a death occurred in the six months prior to the survey utilized thirty-eight months of current savings.

(iii) Sale of assets

Another common coping mechanism adopted by households is the sale of assets (Bonnel, 2000; Topouzis, 2000). In the few East African countries where household impact studies have been conducted the drop in asset ownership in affected households ranged between 40% and 60% (Mutagandura *et al.*, 1999, as quoted in Topouzis, 2000: 14). Rugalema (1999, as quoted in Topouzis, 2000: 14) report that 39 of the 52 AIDS-afflicted households in a Tanzanian village had sold one or more assets in direct response to AIDS morbidity. A large proportion (41%) of households in rural Thailand also sold land to cope (Pitayanon *et al.*, 1997, as quoted in Desmond *et al.*, 2000: 12; Pitayanon *et al.*, 2000), whilst 24% of Zimbabwean households affected by an adult female death sold assets to cope with the death (Mutangadura, 2000). In the case of this study, only a very small percentage of households sold assets in the twelve months prior to the survey (5.5% compared to 5.4% in affected and non-affected households)(Table 9). The small number of assets owned by the average household (3.3) explains why only very few households were able or willing to exercise this financial response to crises. In fact, households may generally prefer to first borrow money or utilize savings before opting to dispose of their assets. Yet, the fact that the value of the proceeds from the sale of assets relative to household income in affected households is much higher than in the case of non-affected households (90% versus 10 %) may imply that proceeds from asset sales represent a very substantial financial coping mechanism.

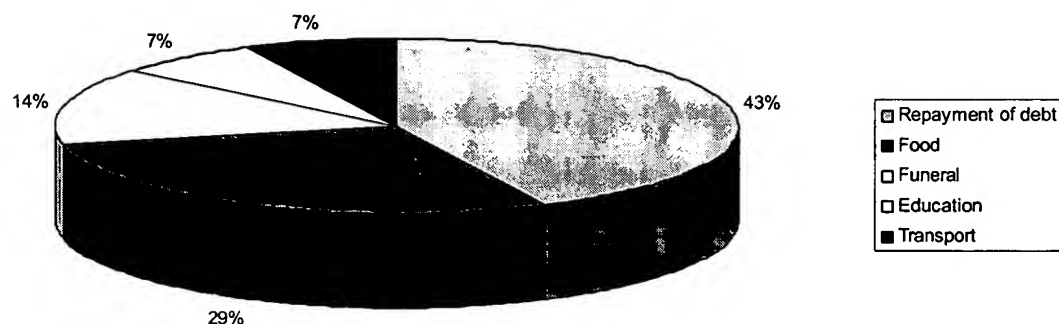
Table 9: Role of assets in risk management

	Welkom Affected		Welkom Non- affected		QwaQwa Affected		QwaQwa Non- affected		Total		Total Affected		Total Non- Affected		P
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
No Total	100	100	99	100	101	100	104	100	404	100	201	100	203	100	
Sold assets in past 12 months	3	3	2	2	8	8	9	9	22	21	11	6	11	5	<0.001
- Affected by illness	1	33	0	0	5	63	4	44	10	46	6	55	4	36	0.007
- Affected by death	1	33	0	0	2	25	0	0	3	14	3	27	0	0	
Average proceeds from sale (Rands)	1250		350		1513		1380		1317		1441		1193		0.009
- % of average annual household income	8.0		4.2		125.8		11.8		50.4		90.4		10.3		0.001
Asset ownership:															
Average asset index (maximum 13)	3.2		3.8		2.8		3.3		3.3		3.0		3.5		0.003
Type of assets sold:															
Household appliances	3	75	0	0	4	44	6	60	13	52	7	54	6	50	
Vehicles	1	25	1	50	0	0	3	30	5	20	1	8	4	33	
Livestock	0	0	0	0	1	11	0	0	1	4	1	8	0	0	
Furniture	0	0	1	50	3	33	0	0	4	16	3	23	1	8	
Other	0	0	0	0	1	11	1	10	2	8	1	8	1	8	
Total	4	100	2	100	9	100	10	100	25	100	13	100	12	100	

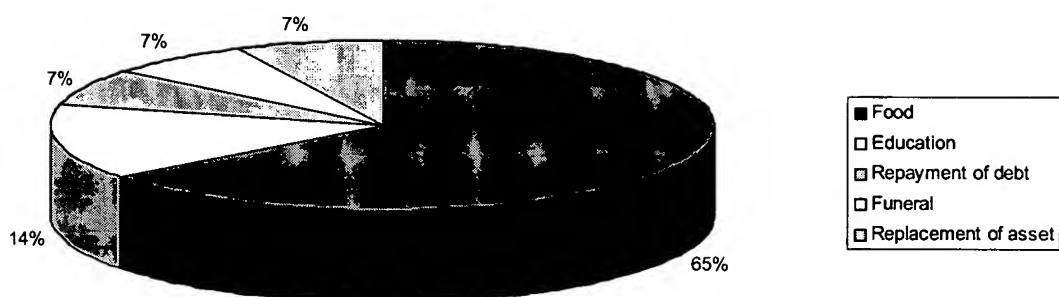
Unlike in the case of new borrowing and the utilization of savings, the reasons these assets were sold for do not outright suggests that HIV/AIDS plays an important role in causing affected households to sell assets (Figure 8). Amongst affected households the primary reasons for selling an asset was to service debt (42.9%), to pay for food (28.6%) or to pay for a funeral (14.3%). In the case of non-affected households the most often cited reasons for selling an asset was to pay for food (64.3%) and education (14.3%). However, this may only indicate that affected households that do sell assets actually do so to pay for expenses they can no longer afford since having to pay for medical expenses and funerals from available resources.

Figure 8: Reason for which households sold assets

(a) Affected households



(b) Non-affected households



Households primarily sold household appliances, which represent more than 50% of the type of assets sold (Table 9). The specific type of appliances sold by households consisted of stoves (5), television sets (3), refrigerators (2), radios or sound systems (2) and a video machine. One affected household in QwaQwa sold some cattle. Three affected households sold furniture compared to one non-affected household, while three non-affected households sold vehicles compared to one affected household. The latter differences between the type of assets sold by affected and non-affected households is understandable insofar as non-affected households have been shown

elsewhere to be relatively richer than affected households, implying that they may own more expensive type of assets. Evident as well from the nature of assets sold by households is that these assets in most cases (with the exception of the sale of cattle by one household) are of a non-productive nature, i.e. these are not assets the household require to in the short term sustain their livelihoods. However, the loss of any asset means that the wealth of that particular household is depleted, in the process making it more difficult to in the longer term cope with the impact of the epidemic. The sale of household appliances and other assets may of course also in the longer run have implications for household labor, with households requiring more labor and/or time to prepare meals, which may in turn have implications for the supply of household labor for other activities and the schooling of children.

(iv) Regression analysis

It can be assumed that non-poor households will be better able to cope with the impact of HIV/AIDS. HIV/AIDS may also cause households to move into and out of poverty as they are affected by illness and death resulting from the epidemic. Hence, it is important to attempt to arrive at a better understanding of the most important predictors of the most common outcomes of financial crises at the household level, i.e. the need to borrow money, to utilize savings and/or to sell assets. Stepwise logistic regression analysis was used for this purpose, with the four different outcome variables indicating whether a household has employed any one or either one of these financial coping mechanisms. The analysis was performed across the entire sample of households. Meaningful models could only be estimated in the case of two of the four outcome variables, namely whether or not households with current savings had to utilize some of their savings in the six months prior to the interview (outcome A) and whether or not households employed any of the three financial coping mechanisms of borrowing, utilization of savings or sale of assets (Outcome B). These results point to the following as important predictors of differences in the ways that households deal with the economic impact of HIV/AIDS.

Table 10: Predictors of economic strategies for coping: Logistic regression models

Explanatory variable	Odds ratio	95% confidence interval	P
A. Outcome: Household utilized savings			
Expenditure (by decile)	1.533	1.279-1.838	<0.001
Age of household head (per ten years)	0.749	0.544-1.033	0.079
Number of recent deaths in the household	6.100	2.397-15.523	<0.001
Someone in the household has access to medical aid	0.158	0.040-0.615	0.008
Dependency ratio	0.982	0.964-1.001	0.070
Summary statistics: n = 403, LR chi2 = 48.03 (P < 0.0001), pseudo R ² = 0.215.			
B. Outcome: Household borrowed money, utilized savings or sold an asset			
Expenditure (by decile)	1.074	0.991-1.163	0.079
Urban versus rural	2.578	1.631-4.074	<0.001
Household size	1.165	1.055-1.286	0.002
Age of household head	0.820	0.696-0.965	0.017
Number of recent deaths in the household	1.917	0.995-3.691	0.052
Summary statistics: n = 403, LR chi2 = 35.16 (P < 0.0001), pseudo R ² = 0.068.			

Households were more likely to have utilized savings when having experienced a larger number of recent deaths. In households where one or more persons had access to medical aid it was less likely that savings would be utilized (Table 10). Households were also more likely to have utilized savings when expenditure was higher, implying that upward pressure on household expenditure may force households to utilize current savings to as to pay for medical and funeral expenses in particular. Households were also more likely to utilize savings in cases where households were headed by younger persons, implying that households headed by younger persons may be more vulnerable to the epidemic. In the last instance, the utilizing of savings was more likely where the dependency ratio was lower, which makes sense insofar as adults in households with fewer children and/or elderly members may be forced to work less insofar as they themselves have to care for the ill or dying, thus putting increasing pressure on household finances. Alternatively, a lower dependency ratio means that a household have fewer members that may qualify for and receive government grants, thereby implying that the smaller non-employment income accruing to such households makes it more likely that households will have to utilize savings to copy with changes in household income and expenditure caused by illness and death.

Any financial coping strategy (i.e. borrowing, utilize savings and the sale of assets) were more likely to have been exercised in households where a larger number of deaths had occurred in the recent past, in households where expenditure on average was higher and in households headed by younger persons (Table 10). Coping financially in one or more of these ways was also more likely in rural than in urban areas, which is understandably given that rural areas are generally considerably poorer than urban areas, as is evident from the differences in expenditure and income levels in Welkom and QwaQwa. The outcome was also more likely as household size increases, which makes sense insofar as a larger household have relatively more expenditure needs than a smaller household, thus making it necessary to borrow, utilize savings or sell assets if households cannot cope with changes in household income and expenditure.

POVERTY AND HIV/AIDS

As a result of the impact of HIV/AIDS on household economics, poverty is likely to deepen as the epidemic takes its course. The above aspects of the socio-economic impact of HIV/AIDS combine to create a vicious cycle of poverty and HIV/AIDS in which affected households are caught up. As adult members of the household become ill and are forced to give up their jobs, household income will fall. To cope with the change in income and the need to spend more on health care, children are often taken from school to assist in caring for the sick or to work so as to contribute to household income. Because expenditure on food comes under pressures, malnutrition often results, while access to other basic needs such as health care, housing and sanitation also comes under threat. Consequently, the opportunities for children for their physical and mental development are impaired. This acts to further reduce the resistance of household members and children (particularly those that may also be infected) to opportunistic infections, given lower levels of immunity and knowledge, which in turn leads to increased mortality (Bonnell, 2000: 5-6; Wekesa, 2000). Households headed by AIDS widows are also particularly vulnerable, because women have limited economic opportunities and traditional norms and customs may see them severed from their extended family and denied access to an inheritance (UNDP, 1998). In many third world situations, therefore, HIV/AIDS exposes already vulnerable, resource-poor households to further shocks. Much of the published

analysis following from the Kagera household study has argued that household wealth and access to public services are very important in protecting households from the impact of HIV/AIDS. Impact was found to only be significantly worse in households affected by adult deaths compared to ones with no adult deaths when controlling for differences in socio-economic status (Ainsworth *et al.*, 2000; Ainsworth and Dayton, 2000; Lundberg and Over, 2000).

In this study, affected households have also been shown to be poorer than non-affected households, both in terms of income and expenditure and regardless of whether income or expenditure is measured at the household, per capita and adult equivalent level. In order to further explore this aspect of the socioeconomic impact of HIV/AIDS at the household level logistic regression was performed with poverty status as outcome. An outcome of one indicates that a household is not poor, with poverty status determined relative to the R800 per month household income employed by the Department of Local Government in providing assistance to indigent households regarding basic service delivery. A poverty status of zero indicates that a household is poor, i.e. monthly household income falls below the R800 level. The analysis was performed employing both income and expenditure as a proxy of standard of living, i.e. setting the poverty status of households relative to both their income and expenditure. Although researchers generally take expenditure to present a better proxy of standard of living than income, results are reported here for both the income- and expenditure-based outcome measures. One can of course explore the analysis with alternative poverty lines, however due to constraints of time this paper has not explored this issue. Included in the stepwise logistic regression analysis as explanatory variables were urban/rural residence, affected/non-affected status of the household, gender and age of the household head, presence or not of illness or death in the household, total number of years of schooling, number of employed members in the household, access to medical aid, and the household size and dependency ratio. Based on the results, the following appears to be the most important protective factors of poverty status.

Table 11: Predictors of poverty status: Logistical regression models

Explanatory variable	Odds ratio	95% confidence interval	P
A. Outcome: Average household income does not fall below R800 per month			
Urban versus rural	0.567	0.336-0.959	0.034
Male versus female head of household	0.600	0.349-1.033	0.066
Dependency ratio	1.014	1.002-1.025	0.016
Household not affected by illness	1.735	1.025-2.937	0.040
Household has access to medical aid	16.604	3.730-73.914	<0.001
Total years of schooling (single years)	1.468	1.236-1.743	<0.001
Number of employed persons in the household	6.016	3.666-9.873	<0.001
Summary statistics: n = 392, Wald chi2 = 189.23 (P < 0.0001), pseudo R ² = 0.351.			
B. Outcome: Average household expenditure does not fall below R800 per month			
Number of employed persons in the household	1.939	1.319-2.850	0.001
Male versus female head of household	0.648	0.393-1.070	0.090
Total years of schooling (single years)	1.575	1.326-1.870	<0.001
Household not affected by illness	1.864	1.134-3.064	0.014
Household has access to medical aid	15.043	5.581-40.548	<0.001
Age of head of household (single years)	0.808	0.669-0.976	0.028
Summary statistics: n = 403, Wald chi2 = 152.79 (P < 0.0001), pseudo R ² = 0.279.			

The single most important predictor of poverty status is access to medical aid (Table 11). Households with access to medical aid respectively were 16 and 15 times more likely to not be poor if poverty status is determined relative to household income and expenditure. There are a number of plausible explanations for this relationship. On the one hand, medical aid may help households affected by illness and/or death to avoid medical expenditures, which could make higher expenditures at a later stage affordable. However, medical aid coverage may also simply be a marker for having a good job, which implies higher income and expenditure. Alternatively, medical aid cover to lower income earners often excludes dependents, meaning that it only protects households if the breadwinner falls ill. Follow-up surveys and the further analysis of this dataset will help elucidate this causal pathway.

In both cases, households not affected by illness was more likely to not be poor, as was households headed by males rather than females, households sharing a larger number of years of schooling between its members, and households with a larger number of employed members. However, the odds ratio for the gender of the head of household was not statistically significant different from one in both cases. Certain explanatory variables featured in the income-based analysis but not in the expenditure-based analysis and vice versa. Where poverty status was based on

household income, households in urban areas, where unemployment rate are generally lower than in rural areas, was less likely to be poor. In addition, households with larger dependency ratios were slightly more likely not to be poor, which may imply that households with more children and older persons find it easier to cope with illness and death insofar as potentially economically active household members do not have to care for ill persons, which may result in a loss of income to the household. In the case of the expenditure-based analysis of poverty outcomes, households headed by younger persons were more likely not to be poor, which may indicate that households headed by older persons, which may more likely consist of orphans and a large number of extended family members, are more likely to not have adequate resources so as to be classified as non-poor.

DISCUSSION

A limitation of the study is that the HIV status of each household member was not known for certain, and the index cases were not identified for reasons of confidentiality. HIV/AIDS status was clearest for those reported to have received a diagnosis of HIV/AIDS, and probably comprised a large proportion of those diagnosed with tuberculosis and pneumonia. Given the high prevalence of HIV infection in these populations, it is likely that at least 10% members of “unaffected” households were HIV-positive but had not to our knowledge had been tested or reported. The various comparisons between “affected” and unaffected households therefore probably underestimate the true differences attributable to HIV/AIDS.

Another limitation is the cross-sectional design of this first part of the cohort study. This means that directions of effect, e.g. between socioeconomic and health-related variables, could not be determined with confidence. Follow-up of these households and individuals will more validly distinguish between antecedent risk factors and subsequent outcomes. One cause for concern is that with deaths having recently occurred in a fifth of affected households, some of these households may no longer contain anyone infected with HIV. However the effects of their deaths are likely to persist in many cases.

Affected households, although larger than non-affected households, actually face more severe resource constraints insofar as household resources have to be shared between larger numbers of mostly economically inactive persons than is the case in non-affected households.

Affected households spend less on food than non-affected households, with per capita and adult equivalent levels of expenditure on food representing between 70% and 80% percent of the levels of expenditure in non-affected households. In the longer run, this may contribute to malnutrition amongst household members. This also means that it will be particularly important to investigate policy programs that can enhance the food security of affected households, e.g. by offering access to food parcels at counseling and support organizations or via home-based care initiatives and/or by capacitating households to where possible grow basic foodstuffs for own consumption.

Difference in expenditure patterns are equally important in terms of understanding the impact of HIV/AIDS on the economy. Affected households, in terms of the composition of regular household expenditure, allocate relatively MORE of their resources on food, health care and rent and LESS to education, clothing, personal items and durables when compared to non-affected households. Similar patterns emerge when comparing the composition of regular household expenditure in affected households that have experienced an illness or recent death to affected households that have not yet had to cope with illness or death. Particular important in terms of these results is the apparent crowding out of expenditure on education, personal items and durables in affected households in favor of expenditure on health care and food.

The utilizing of savings and new borrowing appears to be a common strategy employed by affected households to cope with illness and particularly with a death in the household. The sale of assets is a less common strategy mainly due to households being relatively poor and asset ownership being relatively low. The type of assets sold by households was also mainly of a non-productive nature, implying that the sale of assets have not necessary severely affected the livelihood of affected households. However, the amount of savings utilized and money borrowed by affected households in the recent past are considerably when respectively expressed relative to current

savings and total debt, or relative to average household income. Hence, illness and death appear to put considerably strain on household finances. The danger of course in the longer run is that these actions will move households deeper into poverty as more resources are crowded out in favor of debt repayments in the absence of improvements in household income. On a macroeconomic level, this also has implications for the overall level of domestic savings, which may decline, and the level of interest rates, which may increase in the face of increasing defaults on debt, particularly in the micro-credit industry where household often access credit.

Affected households are poorer than non-affected households, regardless of whether income or expenditure is employed as measure of standard of living or whether income or expenditure is measured at the household or individual level or in adult equivalent terms. The fact that many households rely heavily on social welfare grants as an important source of income furthermore implies that government will in future years be faced with increasing claims as the epidemic takes its course. Access to medical aid has also been shown to be the single most important predictor of poverty status. This may suggest that wider access to affordable medical aid with certain minimum benefits and/or the introduction of a broad-based social security system offering minimal support may be important in mitigating the impact of the epidemic. However, because of the possible alternative explanations for this relationship, the issue requires further analysis of this dataset and the data to be collected in subsequent panels. Continued efforts at poverty reduction are also likely to remain important insofar as education and employment has been shown to offer protection to affected households having to cope with illness and death.

In summary, therefore, the paper shows that households affected by HIV/AIDS bear a substantial burden of illness and death, and that this is associated with more severe poverty. Subsequent follow-up of these households over three years will provide further information on health and socio-economic trends, and will further elucidate the complex causal relationships involved.

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HIV/AIDS and Poverty: Evidence from a Household Impact Study conducted in the Free State province, South Africa¹

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ABSTRACT

Poverty is likely to deepen as the AIDS epidemic takes its course, with households being caught up in a vicious cycle of poverty and HIV/AIDS. This paper shows that affected households are poorer than non-affected households, regardless of whether income is measured at the household, per capita or adult equivalent level and regardless of the poverty line or poverty measure employed in measuring poverty. The incidence, depth and severity of poverty are worse amongst affected households, particularly amongst affected households that have experienced illness or death, with these households being more likely to experience transitory poverty. The strongest single predictor of poverty status is access to medical aid, which hints at the importance of employment and education in explaining differences in socio-economic status. The results suggest that it is not only conventional determinants of poverty, such as employment and education, but also HIV/AIDS-related determinants of poverty, in particular morbidity, that explain why certain households are poor and others not. The evidence underscores the importance in the longer term of economic policies focused on job creation and education in mitigating the impact of HIV/AIDS, with poverty alleviation through an enhanced social safety net being important in the short to medium-term.

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1. INTRODUCTION

The HIV/AIDS epidemic poses a severe threat to the economies of developing countries, and those on the African continent in particular. South Africa, which is being affected fundamentally by the epidemic, is no exception. By the end of 1997, an estimated 2.8 million adults in South Africa were living with HIV/AIDS. By 2001, this figure had increased to 4.7 million. The estimated prevalence of HIV/AIDS among the country's adult population (20.1%) is amongst the highest in the world (ILO, 2000; UNAIDS, 2002). According to the Metropolitan-Doyle model, the annual number of AIDS deaths is estimated to increase from 120 000 to between 545 and 635 thousand between 2000 and 2010. The number of children younger than fifteen years orphaned by AIDS has been estimated to be 800 000 by 2005, rising to more than 1.95 million by 2010 (Abt Associates, 2000: 8-11).

These infected individuals and affected children all belong to individual households (meaning that an even larger number of people are affected by the epidemic in some way) and their deaths will have a significant impact on their families. Poverty, moreover, is likely to deepen as the epidemic takes its course. The socio-economic impact of HIV/AIDS combine to create a vicious cycle of poverty and HIV/AIDS in which affected households are caught up. As adult members of the household become ill and are forced to give up their jobs, household income will fall. To cope with the change in income and the need to spend more on health care, children are often taken from school to assist in caring for the sick or to work so as to contribute to household income. Because expenditure on food comes under pressures, malnutrition often results, while access to other basic needs such as health care, housing and sanitation also comes under threat. Consequently, the opportunities for children for their physical and mental development are impaired. This acts to further reduce the resistance of household members and children (particularly those that may also be infected) to opportunistic infections, given lower levels of immunity and knowledge, which in turn leads to increased mortality (World Bank, 1998; Bonnel, 2000: 5-6; Wekesa, 2000). Households headed by AIDS widows are also particularly vulnerable, because women have limited economic opportunities and traditional norms and customs may see them severed from their extended family and denied access to an inheritance (UNDP, 1998). Worrying, more, is that firms are increasingly using contract labor rather than appointing employees on a permanent basis, which

increasingly shifts the burden of HIV/AIDS onto households and government (Rosen and Simon, 2002). This also means that HIV/AIDS-affected households (and in particular infected persons) may find it increasingly difficult to find employment and remain in employment, which is crucial for ensuring some kind of economic security at the household level. In many third world situations, therefore, HIV/AIDS exposes already vulnerable, resource-poor households to further shocks.

These are all ways in which HIV/AIDS can cause poverty to increase. Whiteside (2001/02) describes the above linkages between HIV/AIDS and poverty in considerably more detail, but then goes on to point out that poverty can also result in increased vulnerability to HIV/AIDS, which in turn can aid the spread of the disease. Poverty, apart from being associated with poor nutrition and a breakdown of immune systems, also stand to increase the vulnerability of people to HIV/AIDS by resulting amongst others in unsafe sexual practices as a result of lack of knowledge and lack of access to means of protection, due to women's inability to negotiate about condom use with sexual partners as a result of entrenched gender roles and power relations, and because of violence and coercion (Whiteside, 2001/02). In fact, both Desmond (2001) and Whiteside (2002) emphasize how complex the relationship between poverty and HIV/AIDS actually is and how many facets it has, e.g. how labor migration induced by rural poverty can contribute to the spread of the disease and how poor, single mothers may be forced to become occasional sex workers in order to survive (Desmond, 2001: 56; Poku, 2001: 195). Gillies *et al.* (1996) and Nyamathi *et al.* (1996), moreover, highlight the importance of homelessness, urban/rural migration patterns, migrant labor practices and the breakdown of social support networks in communities with limited access to social service delivery and in developing countries in increasing the vulnerability of poor people to HIV/AIDS. This paper deals primarily with the question of the extent to which HIV/AIDS (via increased morbidity and mortality, as well as other HIV/AIDS-related impacts) can cause poverty to increase.

2. DATA AND METHOD

The impact of HIV/AIDS on households was assessed by means of a cohort study of households affected by the disease, and compared with a control group of households not currently affected by the disease. The survey was conducted in two local

communities in the Free State province, one urban (Welkom) and one rural (QwaQwa), in which the HIV/AIDS epidemic is particularly rife. Affected households were sampled purposively via NGOs and other organizations involved in AIDS counseling and care and include at least one person known to be HIV-positive or known to have died from AIDS in the past six months. Informed consent was obtained from the infected individual(s) or their caregivers (in the case of minors). Non-affected households represent households living in close proximity to these affected households, but which did not at the time of the first interview include persons suffering from chronic HIV/AIDS-related diseases such as tuberculosis or pneumonia. Households were defined in terms of the standard definition employed by Statistics South Africa in the October Household Survey, i.e. "a person or a group of persons who live together at least four nights a week at the same address, eat together and share resources". A survey on the quality of life and household economics was conducted. Interviews were conducted with one key respondent only, namely the "person responsible for the daily organization of the household, including household finances". The results reported in this paper are based on an analysis of the data for the 387 households that were interviewed in both wave I and in II of this study. The two waves of data collection were respectively completed in May/June and November/December 2001.

Although the sample population in certain instances closely reflects the socioeconomic profile of the national population (e.g. male/female distribution), it in most cases differs distinctly from the general South African population (Booyesen *et al.*, 2002). The profile of the sample of households included in this study can largely be attributed to the sampling design. Given that affected households were sampled from networks and/or organizations involved in counseling, home-based care and public health care and mainly in poorer communities, the sample does not include affected households that mainly utilize private health care services. Moreover, the study was conducted in one specific province (Free State) and in two selected sites only. However, the fact that South Africa's poor, predominantly African population face relatively high HIV prevalence rates and are particularly vulnerable to the epidemic and therefore dependent on support from the public service sphere, means that the findings and policy recommendations put forward in this paper are especially relevant to informing government's responses to HIV/AIDS.

3. DISCUSSION

3.1 Measurement of standard of living

Poverty (or standard of living) is measured at the household rather than the individual level, given that the focus here is on the household impact of HIV/AIDS. Poverty is here interpreted in terms of the command over commodities that resources afford people via income and consumption (Lipton and Ravallion, 1995: 2553-2567). The concern, therefore, is with 'poverty proper' (i.e. resource adequacy) and not with the physiological, sociological or political dimensions of poverty (Kgarimetsa, 1992: 8; Woolard and Leibbrandt, 1999: 3).

Generally, a single monetary indicator, such as income or consumption, is employed in assessing the extent of poverty and inequality (Ravallion, 1996: 1328-1334). Income is argued to reflect consumption opportunities and is therefore a popular measure of poverty (Hagenaars, 1991: 135-146). During the survey, data were collected from one informant regarding the employment income, non-employment income and receipts of remittances for the members of the particular household. An estimate of total monthly household income was derived from these figures by adding up the various component items. Consumption represents an alternative resource base for measuring poverty and inequality (Lipton, 1997: 1003). During the survey, fieldworkers collected expenditure-related data from the household member in charge of household finances in each of these households. This include estimates of household expenditure on specific items such as food, education, health care, transport, monthly repayments of debt, and clothing, as well as remittances made to persons not living with the household. As in the case of income, an estimate of total monthly household expenditure was calculated by adding these items together.

Income, however, in a certain sense represents an inadequate measure of poverty. So, for example, it is generally assumed that household income is employed in a manner that benefits the whole family. Yet, this may not necessarily be the case, given inequalities and inequities in the intra-household allocation of resources (Woolley and Marshall, 1994: 422-429). Furthermore, levels of income and consumption often differ as a result of consumption smoothing. Consumption also represents a better proxy of current living standards and long-term average well being than income for other reasons. Consumption bridges the observed disparity between

income and expenditure levels. Expenditure also reveals information about both past and future incomes, because it includes consumption financed from savings (Lipton and Ravallion, 1995: 2573).

The income-based estimates of household welfare in the case of this study exceed the expenditure-based estimates. Normally, one would expect the opposite, with expenditure-based estimates exceeding income-based estimates of household welfare. This may be because the one informant that was interviewed (i.e. the person in charge of household finances) generally has a better idea of the employment status and average earnings of other members of the household (in fact, the person during the interview often verified this information with other household members). This person, moreover, is unlikely to be knowledgeable about the manner in which each member of the household spends their income. In fact, individuals and/or households have been found to rarely record expenditure data in detail (Woolard and Leibbrandt, 1999: 23-24). Expenditure, therefore, in this case most likely reflects only that amount of resources of household members that is spent on communal household needs.

The literature, moreover, suggests that HIV/AIDS can impact on household income and expenditure in different ways. On the one hand, the changes in the supply of household labor caused by AIDS morbidity and mortality are likely to be accompanied by a drop in household income. On the other hand, household expenditure may increase initially following illness or death, given that households need to spend more on medical care and funerals. In the Kagera study, for example, the total level of expenditure was 25 percent higher in households suffering an adult death than in household where no adult death occurred (Lundberg and Over, 2000). In the case of rural Thailand, though, per capita expenditure in households affected by an adult death on average dropped by 43.5 percent (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44). As a result, the income-based estimates are likely to represent a more reliable measure of the standard of living of these households and are likely to be a better proxy of the impact of HIV/AIDS on household welfare, which means that this paper employs household income as proxy of standard of living rather than household expenditure.

Households with the same level of income do not necessarily enjoy the same level of welfare. The larger the household, the lower the level of welfare at similar levels of household income. Measures of equivalent income are employed to allow for these differences in standard of living related to household characteristics (Lipton and

Ravallion, 1995: 2574; Burkhauser *et al.*, 1997: 154-161). Estimates of household income were here adjusted for differences in household size by dividing total monthly income by n^α , where n represents the number of household members and α an adjustment for household economies of scale (Filmer and Pritchett, 1998: 13). According to Lanjouw and Ravallion (1995) and Drèze and Sen (1997), a α coefficient of 0.6 represents an adequately robust and reliable adjustment for household economies of scale.

3.2 Comparisons of levels of household income

Table 1 report on the average adult equivalent per capita household income of affected and non-affected households. A distinction is also made between affected households that have experienced illness (i.e. a member of the household has been chronically ill in the thirty days preceding the interview) or death (i.e. a member of the household has died in the six months preceding the first interview or in the time elapsed following the first interview) and those that has not been affected by morbidity or mortality.

Table 1: Average Adult Equivalent Per Capita Income for Affected and Non-affected Households

	Total sample	Affected households	Non-affected households	Affected households suffering illness/death	Affected households suffering no illness/death	Non-affected households suffering illness/death	Non-affected households suffering no illness/death
Wave I	715.76	509.83	916.29	449.37	798.88	694.92	971.62
Sample (n)	375	185	190	153	132	38	152
Wave II	623.84	470.69	772.94	410.66	766.94	660.20	799.47
Sample (n)	373	184	189	120	64	32	157

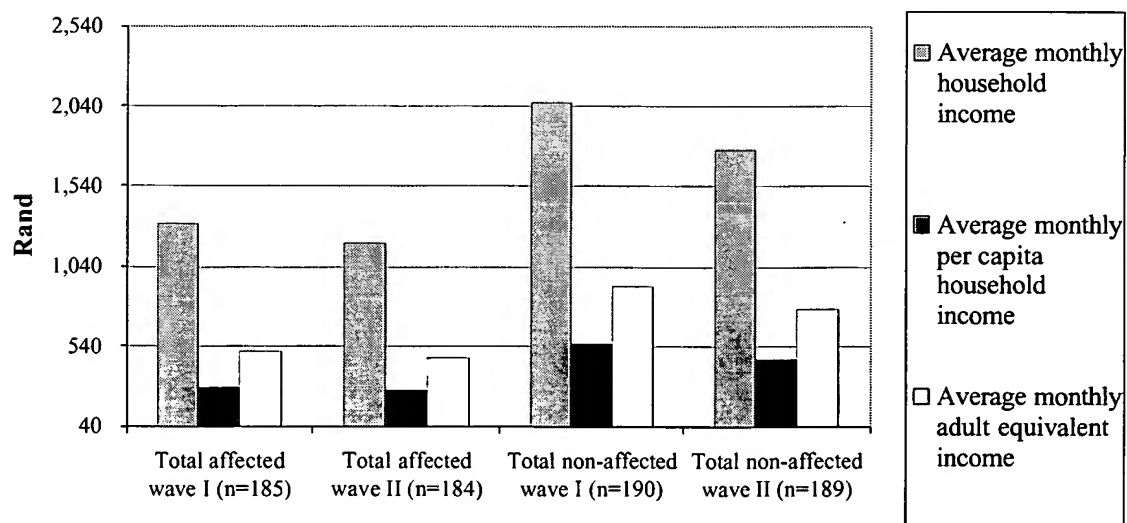
Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The loss of labor supply brought about by AIDS will cause household income to decline (Topouzis, 2000). Consequently, affected households (and in particular ones affected by morbidity or mortality) should be poorer than non-affected households. This fact is born out in the results presented in Table 1 and Figure 1. Adult equivalent per capita income in affected households represents only between 50% and 60% of the levels of income in non-affected households (Table 1), as is the case with total household income and per capita household income (Figure 1). The comparison of the

two groups of affected households (these households all include someone known to be HIV/AIDS positive) presents even clearer evidence of the likely effect of HIV/AIDS on household welfare. The adult equivalent per capita income of affected households that has experienced illness or death is substantially lower than is the case in affected households that has not suffered illness or death (Table 1). This is also the case where non-affected households that have experienced illness or death are compared with ones that have not, thus illustrating how illness and death in general impacts on household welfare even where it is not necessarily related to HIV/AIDS (i.e. testing was not conducted and non-affected households were only screened for the presence of certain chronic illnesses in wave I).

Also evident from Table 1 is that income has declined between the two waves, both in the case of affected and non-affected households as well as in the total sample. These differences in some cases are relatively small, but may be pointing towards a general decline in levels of income. However, it is felt that more panels are required to determine real trends in household income and therefore to substantiate the findings reported here, particularly insofar as income is measured off a relatively low base in this case (i.e. the study population generally is quite poor), which makes it difficult to distinguish between real trends and small differences in income, particularly also in the context of problems of measurement error.

Figure 1: Average household income in wave I and II



Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The available evidence from other household impact studies supports the above findings, i.e. that households affected by HIV/AIDS generally are poorer than non-affected households. Only one study reports on the impact of AIDS morbidity on household income. Households living in rural Chanyanya in the Kafue district in Zambia that were affected by chronic illness had an annual income 46 per cent lower than households in the same area that were not affected by chronic illness (Mutangadura and Webb, 1999, as quoted in Topouzis, 2000: 18). A number of studies have reported on the effect of AIDS mortality on household income. So, for example, households in Zambia that have suffered a paternal death have experienced a drop in monthly disposable income in excess of 80 percent (Nampunya-Serpell, 2000). Households in rural Thailand affected by an adult death saw household income drop by 70.7 per cent, while total per capita income dropped by 68.4 percent (Kongsin *et al.*, 2000, as quoted in Parker *et al.*, 2000: 44). A study in the Ivory Coast, which fails to indicate whether the focus is on AIDS morbidity or mortality, reported that the household income of affected families was found to be half that of total average household income (Bechu, 1998, as quoted in Desmond *et al.*, 2000: 5).

3.3 Comparisons of incidence, depth and severity of poverty

Apart from describing differences between affected and non-affected households in terms of general levels of welfare (or household income in this case), one would also want to determine how poverty differs between affected and non-affected households. To estimate poverty one requires a poverty line, i.e. a level of income below which people are considered poor. Poverty lines provide a yardstick with which to compare the circumstances of individual households. Aggregate measures of poverty cannot be estimated without a poverty line. Armed with the estimate of household income and the poverty line estimate, one can aggregate this information into a variety of descriptive measures of poverty and inequality (Grootaert, 1983: 3-10). The following specific measures of poverty and inequality are employed in this analysis.²

² The estimates of the measures of poverty and inequality that are presented in these pages were calculated with the aid of the POVCAL program developed by the World Bank. POVCAL is an easy to use and reliable tool for routine poverty assessment work. It uses sound and accurate methods for calculating poverty and inequality measures with only a basic PC and any of the various types of grouped distribution data typically available, often in published form. POVCAL estimates a General Quadratic Lorenz curve and Beta Lorenz curve for each data set and then performs a range of tests to assess the validity of each of the Lorenz curves. The measures of poverty and inequality reported in

The *Gini coefficient* (G) represents the average ratio between the proportion of total income actually earned by a specific household and the proportion of income the household would have earned had income been distributed equally. $G = 0$ denotes total equality and $G = 1$ total inequality (Paukert, 1973). Because inequality is an important determinant of poverty, an analysis of the extent of income inequality can provide an important pointer to determining whether poverty is more severe amongst affected than non-affected households. If inequality is more pronounced amongst affected households, one would expect that more affected households fall below the poverty line. This in turn will mean that poverty is more prevalent amongst affected households, which can be determined by comparing the estimates of the following poverty indices across affected and non-affected households.

The *headcount poverty index* (H) is a measure of the prevalence or incidence of poverty, i.e. the percentage of the population with a level of income below the poverty line (z). $H = q/n$, where q represents the number of poor persons falling below the poverty line z and n the total population (Ravallion, 1992/94a/94b; Lipton and Ravallion, 1995). The *poverty gap index* (PG) is a measure of the intensity or depth of poverty that allows for how far the poor fall below the poverty line. The index is calculated as each individual's shortfall below the poverty line (z) summed over the total population. It considers the non-poor to have a zero poverty gap. $PG = 1/n \sum [(z - y_i)/z] = H (1 - \mu/z)$, where H represents the headcount poverty index, μ mean expenditure or income, and z the poverty line (Ravallion, 1992/94a/94b; Ravallion and Bidani, 1994; Lipton; 1997). The *squared poverty gap index* (SPG) represents a measure of the severity of poverty that allows for the extent of inequality amongst the poor. The SPG attaches more weight to those gains furthest from the poverty line. The index is calculated as the mean of the squared proportional poverty gaps over the entire population with the non-poor again counted as having a zero poverty gap. $SPG = 1/n \sum [(z - y_i)/z]^2 = PG^2/H + (H - PG)^2 / H * CV_p^2$, where H and PG respectively represent the headcount and poverty gap indexes, while CV_p^2 is the squared

these pages are based on the General Quadratic Lorenz curves estimated from the tabulated data. The General Quadratic Lorenz curves were invalid only in select cases and then only at the upper extremes of the income distribution, whereas the Beta curves were invalid in most cases. The sum of the squared standard errors over these Lorenz curve were generally extremely small.

coefficient of variation of income or consumption amongst the poor (Ravallion, 1994a/94b; Ravallion and Bidani, 1994; Lipton and Ravallion, 1995; Lipton, 1997).³

Table 2: Estimates of the Headcount Poverty Index (H), Poverty Gap Measure (PG), Squared Poverty Gap Index (SPG) and Gini-coefficient for Affected and Non-affected Households

	Total sample	Affected households	Non-affected households	Affected households suffering illness/death	Affected households suffering no illness/death	Non-affected households suffering illness/death	Non-affected households suffering no illness/death
A. Wave I							
H	36.99	44.74	29.55	48.85	26.11	34.44	27.98
PG	16.32	19.75	13.14	20.93	15.71	15.56	12.44
SPG	9.20	11.21	7.55	11.44	13.27	9.16	7.15
Gini	59.90	56.50	59.60	54.44	60.08	57.91	59.35
<i>Sample (n)</i>	<i>375</i>	<i>185</i>	<i>190</i>	<i>153</i>	<i>132</i>	<i>38</i>	<i>152</i>
B. Wave II							
H	51.03	57.27	44.37	55.63	41.72	46.38	43.24
PG	24.24	27.22	20.67	24.34	20.13	20.02	20.34
SPG	14.55	16.39	12.28	13.82	12.59	11.08	12.23
Gini	69.85	65.33	71.36	58.11	70.25	68.25	71.56
<i>Sample (n)</i>	<i>373</i>	<i>184</i>	<i>189</i>	<i>120</i>	<i>64</i>	<i>32</i>	<i>157</i>

Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually reported an income.

The Gini coefficients and poverty indices calculated for each of the groups of affected and non-affected households are reported in Table 2. The results are here reported only for the poverty line of R250 adult equivalent per capita income, which was employed in the most recent poverty estimates published by Statistics South Africa (2000: 11), albeit not in adult equivalent form. Evident from the results in Table 2 is that the degree of inequality is slightly higher amongst non-affected households than amongst affected households. These differences in the extent of income inequality are even more pronounced in the case of the comparison between the two groups of affected households, i.e. those having experienced illness or death and those not having experienced illness or death, while it also holds for the comparison across the two groups of non-affected households. This may be the result of households experiencing illness or death being more likely to have a lower income, which

³ The headcount, poverty gap and squared poverty gap indices are special cases of the Foster-Greer-Thorbecke (FGT) class of poverty measures. $P_\alpha = 1/n \sum [z - y_i/z]^\alpha$, where z represents the poverty line and y_i the actual income or consumption level of each person or household. The three FGT measures each focus on a different conventional poverty measure. P_0 , P_1 and P_2 respectively are derivatives of the headcount (H), poverty gap (PG) and squared poverty gap (SPG) indices (Greer and Thorbecke, 1986). As explained above, these poverty measures become more sensitive to the well-being of the poorest person as the value of α increases (Woolard and Leibbrandt, 1999: 28).

translates into relatively lower levels of income and relatively less variation in income (at least across the higher ranges), which in turn means that the extent of income inequality is likely to be less pronounced. In the case of non-affected households, variation in household income is more pronounced, translating into higher levels of income inequality. Interesting, furthermore, is that inequality has increased between wave I and wave II of the study, this being the case in all subgroups of affected and non-affected households, as well as in the total sample population. As explained elsewhere, more panels are required to determine real trends in income and therefore in the extent of income inequality.

According to the results presented in Table 2, the incidence, depth and severity of poverty are worse amongst affected households than amongst non-affected households. This is also the case when comparing the estimates of the incidence and depth of poverty across affected and non-affected household that have experienced illness or death as opposed to affected and non-affected households that have as yet not experienced illness or death. According to these estimates, poor, affected households will have to boost their income by nearly twenty (wave I) and twenty-eight per cent (wave II) to reach the poverty line. Non-affected households in turn only have to boost their income by approximately thirteen (wave I) and twenty-one per cent (wave II) to reach the same poverty line. Thus, poverty does appear to be significantly worse amongst affected households. The comparison of poverty estimates across the two rounds of interviews also seems to suggest that the incidence, depth and severity of poverty are on the increase, albeit the case for both affected and non-affected households. In fact, poverty is relatively pronounced in both these communities, with a relatively high proportion of both affected and non-affected households being classified as poor (e.g. the headcount index respectively amounts to 37 and 51 percent in wave I and wave II). According to Statistics South Africa (2000), the headcount poverty ratio in the magisterial districts of Welkom and Witsieshoek (which lies within the boundaries of the former Qwaqwa) respectively are 0.34 (this is likely to be much higher in the African communities in which this survey was conducted) and 0.69, while the estimate of average monthly household expenditure respectively amounts to R2364 (again likely to be much lower for the residents of the African and Colored townships where the survey was conducted) and R807. Again, caution is required insofar as data from more panels are required to validate such

claim and to establish trends in poverty. One may therefore tentatively conclude that poverty indeed is worse amongst affected than amongst non-affected households.

3.4 Robustness of poverty comparisons

In order to further substantiate such argument, one needs to perform a number of poverty comparisons. The main purpose with a poverty comparison is to determine whether the results of such comparison are robust and consistent. The conclusion drawn from a poverty comparison, i.e. whether affected households are poorer than non-affected households or not, should not be dependent on the choice of a particular standard of living indicator, poverty line, or poverty measure (Ravallion and Bidani, 1994: 76; Ravallion, 1994b: 44-51). The robustness of a poverty comparison is determined by comparing the headcount, poverty gap and squared poverty gap index across a critical range of poverty lines. Arbitrariness is practically unavoidable in setting poverty lines, primarily because of the multitude of methods that are employed for this purpose (Kgarimetsa, 1992: 9; Alcock, 1993: 60-62; Johnson, 1996: 110-112). Hence, the standard practice has become one of testing the robustness of poverty lines by simultaneously employing more than one such estimate in poverty analysis. Ravallion (1994b: 43) refers to this as the use of dual poverty lines. Results are compared across poverty line estimates based on different methodologies and/or alternative assumptions made using similar methods (Lipton and Ravallion, 1995: 2577; Lipton, 1997: 1003). A similar approach is followed here. The range of poverty lines used for this purpose varies from R100 to R600 in adult equivalent per capita terms, which covers all the currently available poverty line estimates for South Africa, even when allowing for the effect of inflation (Klasen, 1997: 56; Woolard and Leibbrandt, 1999: 14; Booysen, 2001: 680). Partial poverty orderings or poverty value curves are used for the purposes of presenting the results (Ravallion, 1994b: 1-3; Woolard and Leibbrandt, 1999: 12). To obtain these curves, estimates of the headcount, poverty gap and squared poverty gap indices for the subgroups of households are plotted for the critical range of poverty lines. The values of the poverty measure are plotted on the vertical axis and the cumulative values of the poverty line are plotted on the horizontal axis. A comparison is robust and consistent if the poverty value curve for one subgroup dominates and/or matches that of another subgroup across the entire range of poverty line estimates. This means that one

subgroup is poorer than another subgroup regardless of the poverty line used for comparative purposes. Only the poverty incidence dominance curves for each of the four main clusters of households are reported here (Figures 2 to 5). According to Ravallion and Sen (1996: 776), the conditions for dominance are likely to hold for the poverty gap and squared poverty gap measures if it holds for the headcount index.

Figure 2: Incidence of poverty in affected and non-affected households (wave I)

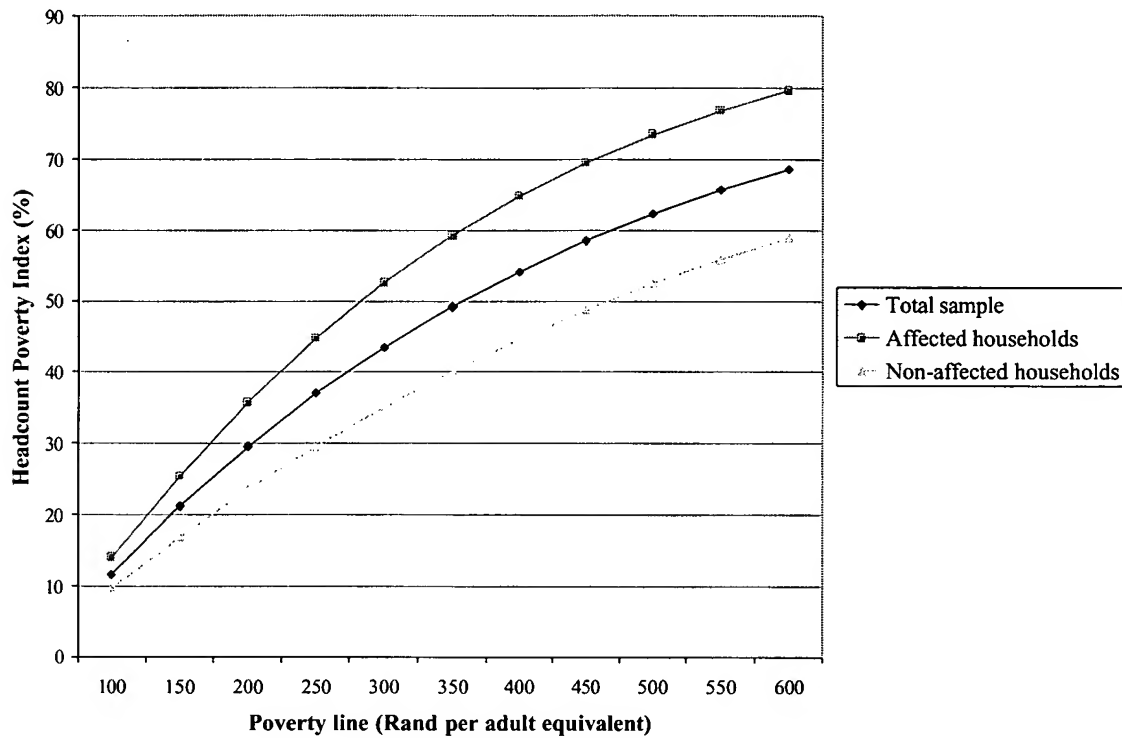
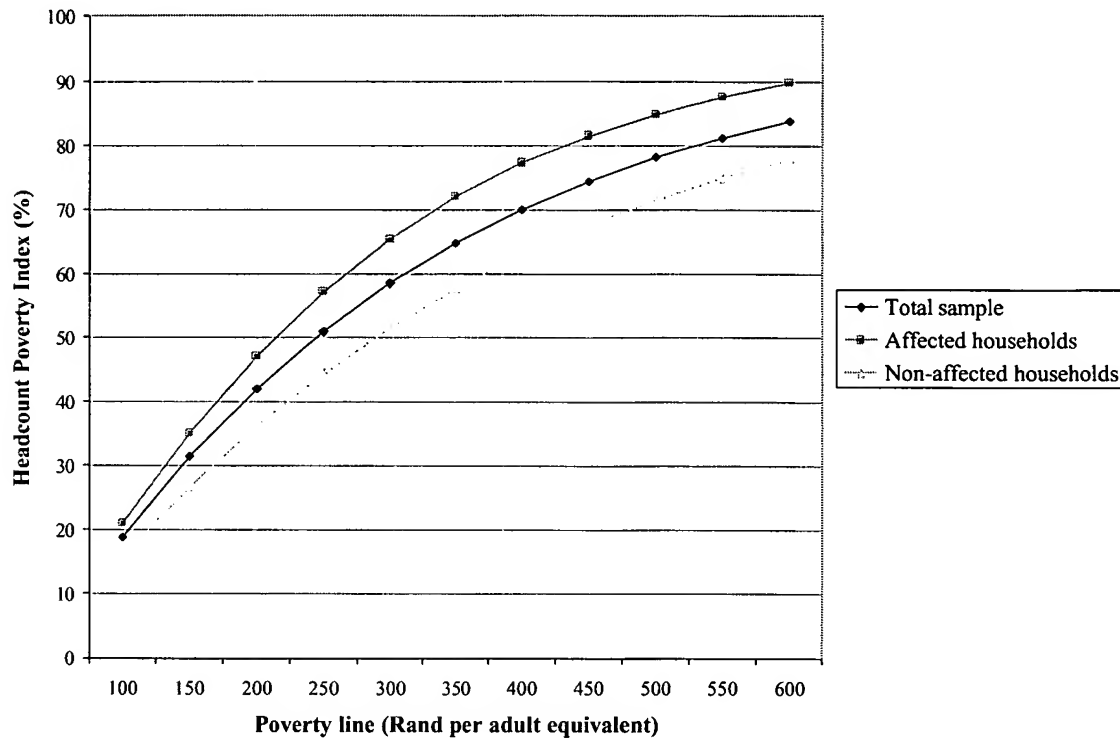


Figure 3: Incidence of poverty in affected and non-affected households (wave II)



Evident from Figures 2 and 4, is that levels of poverty are generally higher amongst affected households, regardless of the choice of poverty line. The poverty incidence curve for affected households dominates that for non-affected households across the entire range of poverty lines. Poverty, therefore, does seem to be worse amongst affected households. The fact that the socio-economic impact of AIDS is indeed worse in poorer households has been confirmed by Nampanya-Serpell (2000), while much of the analysis following from the Kagera household study has argued that household wealth and access to public services are very important in protecting households from the impact of HIV/AIDS. Impact was found to only be significantly worse in households affected by adult deaths compared to ones with no adult deaths when controlling for differences in socio-economic status (Ainsworth *et al.*, 2000; Ainsworth and Dayton, 2000; Lundberg and Over, 2000). Another test of the robustness of the findings presented here is the extent to which poverty is consistently worse amongst households that have directly experienced illness and/or death. Figures 4 and 5 represent the poverty incidence curves for affected and non-affected households by incidence of illness and/or death.

Figure 4: Incidence of poverty in affected and non-affected households by incidence of illness and/or death (wave I)

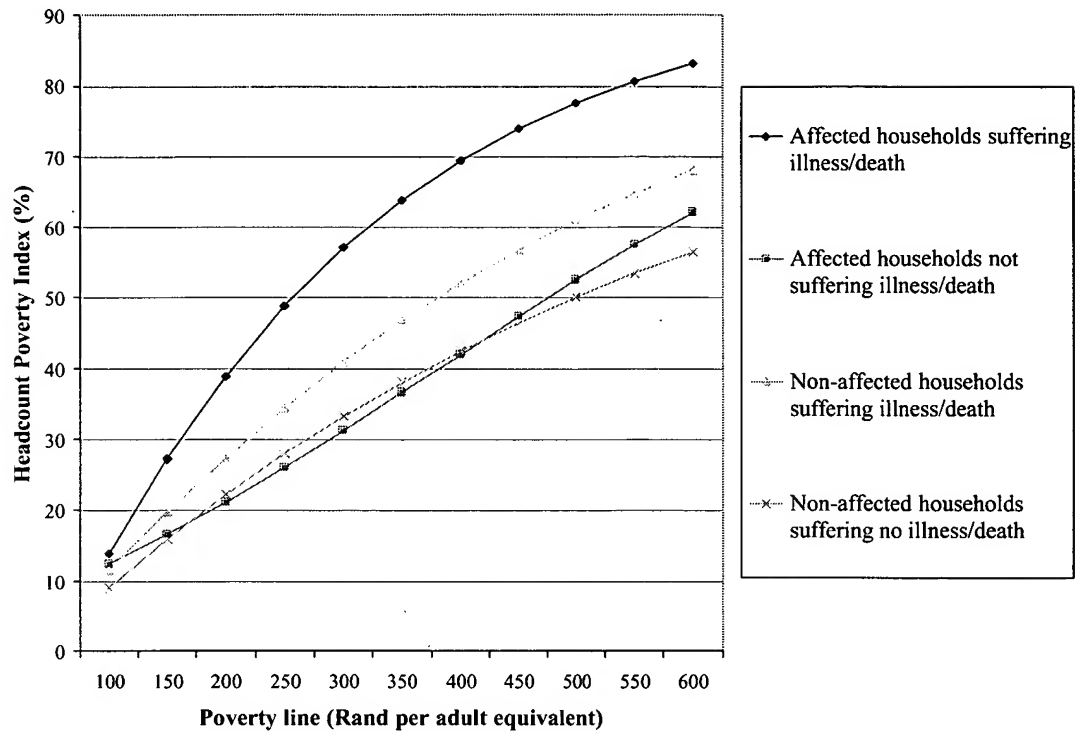
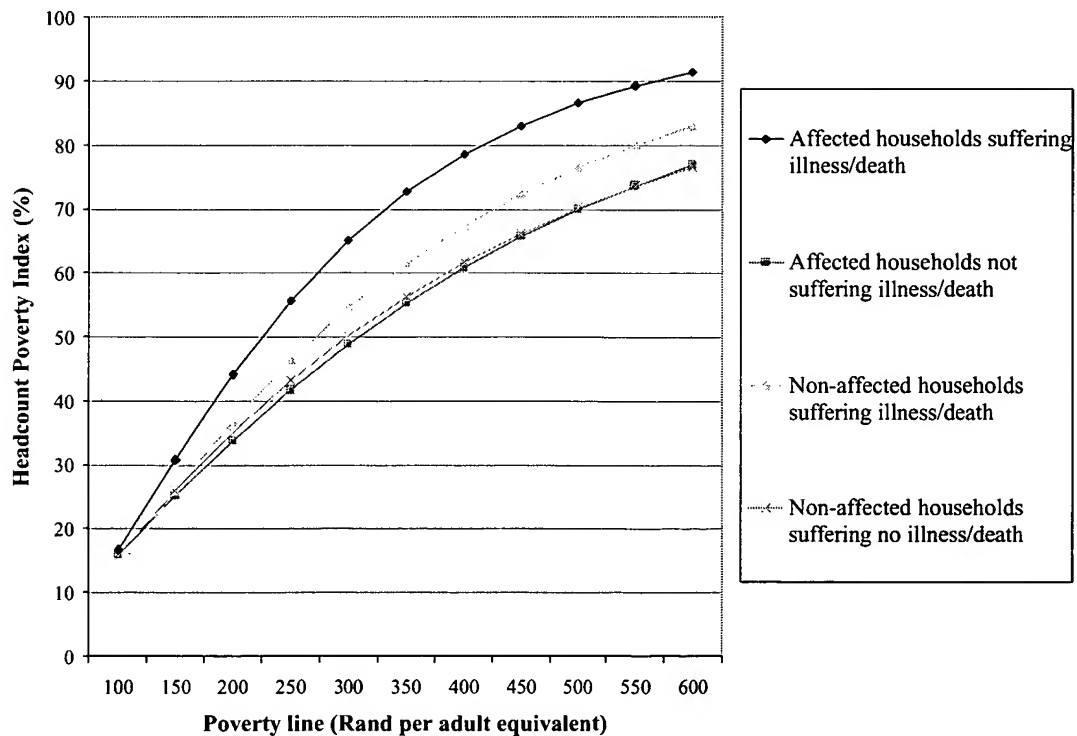


Figure 5: Incidence of poverty in affected and non-affected households by incidence of illness and/or death (wave II)



In the case of affected households (i.e. households including at least one person known to be HIV-positive), the incidence of poverty indeed is higher amongst affected households that have experienced illness and/or death than in affected households where this is not the case, regardless of the poverty line employed in quantifying the extent of poverty. Again, therefore, the evidence seems to suggest that HIV/AIDS is likely to result in poverty. In the case of non-affected households, however, the comparison is not consistently robust, with the poverty incidence curves crossing at the bottom end of the range of poverty lines in wave II (Figure 5), although being robust in wave I (Figure 4). This could be the result of these households being in a better position than affected households to cope with the resulting loss of supply of labor and household income, e.g. having access to medical aid and having other household members in employment. Yet, it may also be because of the relatively small number of non-affected households that have experienced illness and/or death ($n < 40$), which makes meaningful comparisons difficult.

3.5 Poverty shares

The above analysis does not take into account how many affected households there are in comparison to non-affected households. Hence, the analysis fails to highlight the extent to which affected and non-affected households share the burden of poverty. Such analysis requires poverty measures that are additively decomposable. Additive decomposability means that overall inequality can be portioned into inequality between subgroups and within subgroups. Decomposition across space requires measures of the type $P_{\alpha} = n_A P_{\alpha A} + n_B P_{\alpha B}$, where A and B represent two subgroups and n_A and n_B the population shares of the two groups that the poverty estimate P_{α} for each group is weighted by (Lipton and Ravallion, 1995: 2580-2581). The FGT class of poverty measures is additively decomposable. This feature of the three measures of poverty employed in this analysis makes it possible to determine the share of affected and non-affected households in the poverty burden. Poverty shares were calculated separately for affected and non-affected households, as well as for affected households that have and have not experienced illness and/or death in the recent past. Poverty shares were calculated with reference to the R250 adult equivalent per capita poverty line. The evidence suggests that there is not such a great difference between

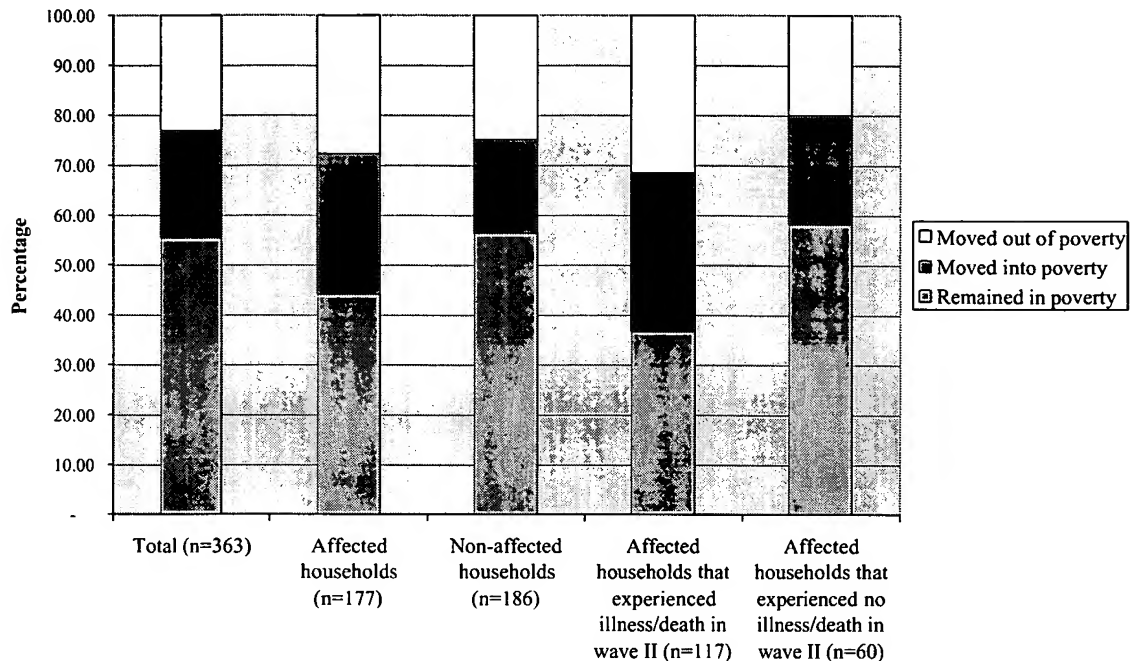
the share of poverty shouldered by affected and non-affected households, although affected households bear a larger share of the total burden of poverty, perhaps because of the fact that the two samples are almost equal in size. Affected households have borne 53.1 (wave I) and 59.9 percent (wave II) of the burden of poverty, compared to the 46.9 (wave I) and 40.1 percent (wave II) borne by non-affected households. However, when the poverty shares are calculated across the sub-sample of affected households only, the results underscore the extent to which affected households that have experienced illness and/or death bear the brunt of poverty compared to affected households not yet affected by illness or death. Households that have experienced illness and/or death respectively have borne 71.3 (wave I) and 90 percent (wave II) of the burden of poverty on affected households. As a result, policies aimed at poverty alleviation can be argued to be particularly crucial in sustaining the livelihoods of affected households that have actually experienced illness and/or death.

3.6 Poverty transitions

Given the longitudinal design of this study, it is also possible to consider the extent to which affected and non-affected households move into and out of poverty over time, or alternatively remain in poverty. According to May and Roberts (2001: 100), this is one of the main advantages of panel studies, namely to distinguish between transitory and persistent poverty. Poverty transition matrices are particularly useful in distinguishing between the extent of transitory and persistent poverty in affected and non-affected households. A poverty transition matrix represents the proportion of households classified as poor in each of the two periods (i.e. wave I and II) relative to a particular poverty line. Households on the diagonal in the matrix have remained in poverty, whereas households to the left and right of the diagonal have respectively fallen into and moved out of poverty (May and Roberts, 2001: 106-107). The main question here is whether affected households are more likely to experience transitory and/or persistent poverty than are non-affected households. One would expect affected households (due for example to the changes in income caused by illness and/or death) to move into and out of poverty to a larger extent than non-affected households. Yet, affected households may in the longer term also experience higher levels of persistent poverty, because of the cumulative impact of the loss of household member that are economically active and the effects of increased stigmatization on

these households, which may further alienate them from existing community support structures and exclude their members from labor markets.

Figure 6: Poverty transitions between wave I and wave II



Note: The reported sample sizes reflect those of the total 387 households interviewed in both waves that actually responded to the questions on household income in both interviews.

Figure 6 reports on the percentage of households in each cluster that remained in poverty (those on the diagonal), that that moved out of poverty (those to the right of the diagonal) and those that fell into poverty (those to the left of the diagonal). Poverty status was set relative to different categories of income relative to the R250 adult equivalent per capita level. The detailed poverty matrices for these four clusters of households are reported in Appendices A to D. A distinction is made between affected (Appendix A) and non-affected households (Appendix B), as well as between affected households that respectively have experienced illness or death (Appendix C) or not (Appendix D).

Evident from Figure 6 (as was the case elsewhere) is the relative persistence (and high incidence) of poverty amongst these households. More than half of the households could be classified as poor in both wave I and wave II. The results also suggest that affected households are more likely to experience transitory poverty, which makes sense insofar as affected households are more likely to be affected by

morbidity and mortality, which in turn are associated with short-term fluctuations in household income. A larger proportion of non-affected households (i.e. 56.5 percent) remained in poverty compared to affected households (i.e. 44.1 percent). The comparison across affected households that have experienced illness or death between the two rounds of interviews and affected households that have not presents a similar picture. In this case, 36.8 percent of affected households that experienced illness or death remained in poverty, whereas 58.3 percent of households that did not experience illness or death remained in poverty. Hence, larger proportions of affected households and in particular affected households that have experienced illness or death have moved out of or into poverty, i.e. experienced transitory rather than persistent poverty. In addition, it appears as if a larger proportion of affected households and affected households that had experienced illness or death had moved into poverty than had moved out of poverty compared respectively to non-affected households and affected households that had not experienced illness or death, although a larger share had also moved out of poverty. This suggests that HIV/AIDS may be pushing households into poverty, at least in the short-term, while households are also moving out of poverty following illness or death.

It is important, therefore, to conduct further analysis to identify the particular reasons why these households have moved into and out of poverty, e.g. whether the loss in income was caused by the death of a main breadwinner or whether the increase in household income was caused by an increase in the number of employed members in the particular household. Also of importance is the relationship between these poverty transitions and the timing of the death, e.g. one would expect poverty transitions to be more pronounced (i.e. a larger number of households moving across more than one cell in the poverty matrix) the shorter the time that has elapsed between the death and the second measurement of household welfare. The regression results discussed towards the end of this paper goes some way towards answering these particular questions, although further work is required in this regard, particularly with reference to the relationship between poverty transitions and the timing of the death relative to the measurement of household welfare. However, as explained elsewhere, the above results should be interpreted with caution insofar as measurement error (which normally is relatively pronounced in the measurement of economic variables) may be important in explaining part of the variation in the classification of households as poor or non-poor in the respective waves of this panel study.

3.7 Determinants of poverty

In order to further explore the relationship between poverty and HIV/AIDS, some multiple logistic regression analyses were performed with poverty status as outcome, particularly with a view to determining those factors that act to protect households against poverty or in turn increase their vulnerability. Janjaroen (1998), for example, report that differences between affected households in adult equivalent per capita expenditure are small and are not statistically significant, except when controlling for socio-economic status and vulnerability by for example allowing for differences in education of the household, gender of the deceased and the duration of illness. One can of course perform such analyses with alternative poverty lines to test the robustness of these findings. However, due to constraints of space and time this has not been attempted in this paper. Adult equivalent per capita household income was employed as a proxy of standard of living. For the purpose of these analyses, an outcome of one indicates that a household is not poor, i.e. adult equivalent per capita household income exceeds R250, while zero indicates that a household is poor, i.e. adult equivalent per capita household income falls below the R250 level. The results are reported in Tables 3 and 4. Separate analyses were performed with the data from wave I (Table 3) and from wave II (Table 4) to determine the robustness of the results. Results are also reported separately for the affected and non-affected groups of households to identify possible differences between the determinants of poverty in these two groups of households. Included in the multiple logistic regression analyses as explanatory variables were urban/rural residence, affected/non-affected status, gender and age of the household head, the number of ill persons or recent deaths in the household, the number of orphans sheltered by the household, the total number of years of schooling of all household members, the number of employed members in the household, access to medical aid, and the household size and dependency ratio. The emphasis in the subsequent discussion falls particularly on the significant determinants of poverty that feature in both the wave I and wave II analyses.

Table 3: Predictors of household poverty status based on income: Logistical regression models (wave I)

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	OR	P	OR	P	OR	P
Urban versus rural location	0.649	0.097	0.638	0.186	0.646	0.315
Male versus female head of household	0.703	0.191	0.453	0.024	1.200	0.705
Affected versus non-affected status	1.194	0.548				
Household size	0.653	<0.001	0.769	0.044	0.503	0.002
Age of head of household (by deciles)	1.363	0.001	1.107	0.407	1.808	0.001
Years of schooling (by deciles)	1.357	0.031	1.235	0.240	1.558	0.085
# employed household members	3.134	<0.001	2.320	0.004	4.409	<0.001
Access to medical aid	26.578	0.002	11.310	0.028		
Dependency ratio	1.011	0.074	1.012	0.139	1.015	0.200
# persons that are ill	0.864	0.393	0.924	0.694	0.814	0.576
# persons that have died	1.906	0.111	1.908	0.125		
# orphans in household	0.884	0.440	1.038	0.866	0.805	0.402
Sample (n)		405		202		161
LR chi2 (P)		109.68 (<0.001)		38.29 (<0.001)		50.66 (<0.001)
Pseudo R ²		0.216		0.143		0.248

Note: Odds ratios and P values in bold are statistically significant at the 0.10 level. In the regression model for non-affected households, "access to medical aid" (41 observations) and "# of persons that have died" (1 observation) respectively predicted success and failure perfectly and were excluded from the model.

Table 4: Predictors of household poverty status based on income: Logistical regression models (wave II)

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	OR	P	OR	P	OR	P
Urban versus rural location	0.730	0.246	0.653	0.242	0.987	0.977
Male versus female head of household	0.484	0.010	0.338	0.005	0.623	0.285
Affected versus non-affected status	0.901	0.717				
Household size	0.610	<0.001	0.634	0.001	0.469	<0.001
Age of head of household (by deciles)	1.176	0.001	1.134	0.048	1.272	0.006
Years of schooling (by deciles)	1.327	<0.001	1.344	0.006	1.518	0.002
# employed household members	2.184	0.001	1.304	0.170	5.706	<0.001
Access to medical aid	11.162	0.022	5.243	0.133		
Dependency ratio	1.024	0.001	1.023	0.020	1.036	0.003
# persons that are ill	0.809	0.322	0.748	0.254	1.269	0.601
# persons that have died	0.620	0.247	0.557	0.218	0.188	0.201
# orphans in household	1.065	0.656	1.324	0.175	0.852	0.483
Sample (n)		387		193		161
LR chi2 (P)		87.15 (<0.001)		40.27 (<0.001)		44.92 (<0.001)
Pseudo R ²		0.191		0.167		0.230

Note: Odds ratios and P values in bold are statistically significant at the 0.10 level. In the regression model for non-affected households, "access to medical aid" (30 observations) predicted success perfectly and were excluded from the model.

Only one determinant of poverty status featured in all six regression models, i.e. the total sample and sub-samples of affected and non-affected households interviewed in wave I and in wave II of the survey (Tables 3 and 4). Smaller (larger) households were more (less) likely to be classified as non-poor, which makes sense insofar as the available household resources are divided between fewer (more) persons, thus increasing (decreasing) the aggregate level of welfare of the particular household.

A number of other conventional determinants of poverty also featured in these models, although the results were not always statistically significant in all six of the regression models presented in Tables 3 and 4. The strongest single predictor of poverty status was access to medical aid. Households with access to medical aid in general respectively were 26 (wave I) and 11 times (wave II) more likely to not be poor. There are a number of plausible explanations for this relationship. On the one hand, medical aid may help households affected by illness and/or death to avoid medical expenditures, which could make higher expenditures at a later stage affordable. However, medical aid coverage may also simply be a marker for having a good job, which implies higher income and expenditure. Alternatively, medical aid cover to lower income earners often excludes dependents, meaning that it only protects households if the breadwinner falls ill. Most likely, though, access to medical aid here represents a proxy of socio-economic status rather than a factor directly linked to the impact of HIV/AIDS, given that most ill persons and those that have died had accessed public health care facilities (Booysen *et al.*, 2002). Follow-up surveys and the further analysis of this dataset will help elucidate this causal pathway.

Households with a larger number of employed members and households sharing a larger number of years of schooling between its members were as expected more likely to be non-poor, as were households residing in urban rather than rural areas, and households headed by females and by older persons. Households with larger dependency ratios were also more likely to be classified as non-poor. In the case of affected households, the latter may imply that households with more children and older persons find it easier to cope with illness and death insofar as potentially economically active household members do not have to care for ill persons, which may result in a loss of income to the household. However, this result is ambiguous insofar as one would have expected a higher dependency ratio to increase the likelihood of being classified as poor, given that the household has to share its resources amongst a larger number of primarily economically inactive persons. This

particular finding needs to be explored in relation to the receipt of social welfare grants, especially old age pensions and child support grants. Uptake of these grants may mean that households with more children and elderly persons actually are more likely to be classified as non-poor in societies characterized by high levels of unemployment.

The HIV/AIDS specific determinants of poverty included in these regression models, i.e. the number of persons in each household that reportedly were chronically ill in the month preceding the interview or that had died in the six months preceding the interview and the number of orphans sheltered by the household, did not feature as statistically significant determinants of poverty. Interesting, however, is that these variables did feature in the regressions that employed total average household income rather than adult equivalent per capita income as measure of household welfare. Poverty in this case was defined relative to the guideline of R800 per household per month employed by local government in administering indigent policy in South Africa. Affected households, i.e. households that include at least one person that is known to be HIV-positive, in wave II were more likely than non-affected households to be classified as poor, as were households that had experienced a larger number of recent deaths (i.e. deaths occurring in the period between the two rounds of interviews). In the case of affected households (wave II), the number of orphans also featured as a significant determinant of poverty. Affected households with more orphans were more likely to be classified as non-poor. One would however have expected households with more orphans to be more likely to be poor, given that the available resources have to be shared amongst more people. As argued elsewhere, this particular finding needs to be explored in relation to the uptake of child support grants, because households with a larger number of orphans theoretically are in a position to access these grants, thus boosting their household income. Lastly, non-affected households including a larger number of ill persons were more likely to be non-poor. This result is spurious, given that increased incidence of illness is more likely be associated with poverty. Further analysis it is hoped will be able to tease out the reasons behind this result.

The longitudinal design of this study also allows one to perform analyses that look at the relationship between poverty and its determinants over time. This allows one to look at the determinants of poverty in the shorter and longer term, i.e. those factors that explain why households may have remained in poverty over the entire

period, remained poor only in the short term (classified as poor in wave I or in wave II) or not been classified as poor in either wave of the panel. The results of these analyses are reported in Table 5. Certain baseline (wave I) characteristics were included in the analysis, e.g. place of residence, affected status, household size, the age and gender of the head of the household, and the years of schooling and number of employed members. Other variables, such as the dependent variable, now distinguish between households that were classified as non-poor in both waves (value=3), as non-poor in wave II only (value=2) or non-poor in wave I only (value=1), and those classified as poor in both waves (value=0). As in the case of the other results presented here, the poverty line was set with reference to the R250 adult equivalent per capita level. The following variables based on changes between wave I and II were also included in the regression analyses:

- access to medical aid in wave I and II, i.e. whether households had access to medical aid in both waves, only in one, or in neither wave
- change in household size between wave I and II
- change in dependency ratio between wave I and II
- incidence of morbidity in wave I and II, i.e. whether households had experienced illness in both waves, only in one, or in neither wave
- incidence of mortality in wave I and II, i.e. whether households had experienced a recent death in both waves, only in one, or in neither wave
- change in shared number of years of schooling between wave I and II
- change in number of employed household members between wave I and II
- sheltering of orphans by household, i.e. whether households had sheltered an orphan in both waves, only in one, or in neither waves
- household moved to a new residence between wave I and II
- change in gender of the head of the household between wave I and II, either from male to female or from male to female
- change in age of the head of the household between wave I and II

Table 5: Predictors of income-based household poverty status between waves I and II: Multiple regression models

Explanatory variables and summary statistics	Total		Affected households		Non-affected households	
	β	P	β	P	β	P
Urban versus rural location in wave I	-0.222	0.057	-0.184	0.283	-0.306	0.055
Affected versus non-affected status	-0.125	0.386				
Access to medical aid in waves I and II	0.404	<0.001	0.379	0.015	0.460	<0.001
Male versus female head of household in wave I	-0.179	0.137	-0.392	0.026	-0.060	0.707
Age of head of household (by deciles) in wave I	0.140	0.001	0.059	0.337	0.185	0.001
? in household size between wave I and II	-0.084	0.262	-0.293	0.003	0.206	0.099
Affected by morbidity in waves I and II	-0.224	0.008	-0.310	0.006	-0.189	0.175
Affected by mortality in waves I and II	-0.032	0.829	-0.070	0.671	-1.229	0.015
Total years of schooling in wave I	-0.110	0.008	-0.129	0.018	-0.013	0.833
? in years of schooling between waves I and II	0.071	0.087	0.168	0.007	-0.035	0.529
Total number of employed members in wave I	0.333	<0.001	0.172	0.229	0.388	0.001
? in number of employed household members between waves I and II	0.151	0.051	0.069	0.444	0.311	0.049
Household sheltered orphan in waves I and II	-0.013	0.861	0.116	0.256	-0.067	0.533
Household did not live at same residence during waves I and II	-0.225	0.590	0.177	0.752	-0.254	0.699
? in gender of household head between waves I and II	-0.417	0.040	-0.578	0.034	-0.128	0.685
? in dependency ratio between waves I and II	-0.000	0.996	-0.002	0.475	0.005	0.136
? in age of household head between waves I and II	0.001	0.895	0.016	0.160	-0.053	0.019
Constant	2.380	0.001	2.641	0.002	2.842	0.005
Sample (n)		386		194		192
F value (P)	5.67 (<0.001)		3.67 (<0.001)		4.90 (<0.001)	
Adjusted R ²	0.170		0.181		0.231	

Note: Poverty line = R250 adult equivalent per capita income per month. Coefficients and P values in bold are statistically significant at least at a 0.10 level, using a two-tailed t test.

According to the results presented in Table 5, households in all cases (i.e. in the total sample and sub-samples) were less likely to be poor if they had access to medical aid at the time the two rounds of interviews were conducted. As argued elsewhere, access to medical aid here most likely represents a proxy of socio-economic status rather than a factor directly linked to the impact of HIV/AIDS.

As in the case of the results presented in Tables 3 and 4, the other statistically significant determinants of poverty status featured only in some of the regressions, e.g. the total sample or the sample of affected and non-affected households. *Households in general* were more like to have remained in poverty if they reside in a rural area, if the household in wave I was headed by an older person and by a female, if the household was affected by morbidity in both waves, and if headship of the household had changed in terms of the gender of that person. Education and employment also featured as significant determinants of poverty. Household that at baseline had included a larger number of employed persons were more likely to be classified as non-poor, as were households in which the total years of schooling and number of employed members had increased between the two rounds of interviews. The coefficient of the years of schooling at baseline was also statistically significant, but had the wrong sign (households with fewer years of schooling at baseline were more likely to be classified as non-poor, whereas as one would have expected the opposite to be the case).

In the case of *affected households*, household were more likely to remain in poverty if the household at baseline was headed by a female, if the size of the household had declined, if the household was affected by morbidity in both waves, if the number of years of schooling share by the members of the household had declined, and if headship of the household had changed in terms of the gender of that person. As in the case of the regression results for the combined sample of affected and non-affected households, the coefficient of the years of schooling at baseline, although statistically significant, had the wrong sign, with households with fewer years of schooling at baseline being more likely to be classified as non-poor.

Non-affected households in turn, were more like to have remained in poverty if they reside in a rural area, if the household head at baseline was an older person, if the age of the head of the household had increased, if the size of the household had increased, and if the household was affected by mortality in both waves. Non-affected households were also more likely to consistently be classified as poor if the household

at baseline had included a smaller number of employed members and if the number of employed persons in the household had declined by the time of second round of interviews.

Differences, therefore, in the incidence of morbidity represents a significant determinant of poverty status, with households in general and in particular affected households that were not affected by morbidity in either wave being less likely to be classified as poor. This may point to the possible role of chronic HIV/AIDS-related illness in entrenching poverty at the household level. In the case of the non-affected households, households that had not experienced a death in either wave were more likely to be classified as non-poor. The fact that this is only true for non-affected households and not for affected households or for households in general may be the result of deaths in affected households (where almost all the reported deaths occurred) not resulting in an income loss due to the person not being employed at the time immediately before or leading up to their death (Booyesen *et al.*, 2002).

Interesting as well, is the difference in the nature of the relationship between changes in the household size and poverty status. Affected households were more likely to be classified as non-poor if the size of the household had declined, which makes sense insofar as it means that available resources are divided amongst fewer members. Non-affected households in turn were more like to be non-poor if the size of the household had increased. This could mean that those members joining non-affected households are more likely to contribute to household income than is the case with affected households, where in-migrating members may be orphaned children or the elderly members from the extended family having to care for these children and/or the ill person in that household. More analysis (particularly of the data collected on the characteristics of persons leaving and joining these households between consecutive rounds of interviews) is required to further explore these particular dynamics of changes in household income.

In summary, these regression results show that not only conventional determinants of poverty (e.g. place of residence, gender of household head, employment and education), but also HIV/AIDS-related determinants (e.g. incidence of morbidity) play a role in explaining why some households are poorer than others.

4. CONCLUSION

Affected households are poorer than non-affected households, regardless of whether income is measured at the household or individual level or in adult equivalent terms and regardless of the poverty line and poverty measure employed in measuring poverty. These poverty comparisons are relatively robust, particularly so in the case of the comparison of affected households that have experienced illness or death (and who also bear the major share of the burden of poverty) with affected households that have not experienced illness or death. In other words, the incidence, depth and severity of poverty are relatively worse among affected households and especially among affected households that have suffered illness or death in the recent past.

Evident as well is that affected households and particularly households that have recently experienced illness or death may be more likely to experience transitory poverty, i.e. to have moved into or out of poverty over time, which probably indicates the extent to which morbidity and mortality cause household income to fluctuate. There is also evidence that the extent of income inequality and the incidence, depth and severity of poverty within this relatively small sample of households may be on the increase, albeit the case in both the affected and non-affected group of households.

The regression results suggest that not only conventional determinants of poverty, such as employment, education and household size, but also HIV/AIDS-related determinants such as the presence of morbidity play a role in explaining why some households are poorer than others. Lack of access to medical aid has been shown to be the strongest single predictor of poverty status, which probably hints at the importance of employment and education in explaining differences in socio-economic status. The findings therefore suggest that the introduction of a broad-based social security system offering minimal benefits or of specifically targeted welfare programs may in the short and medium term be important in mitigating certain aspects of the impact of the epidemic, e.g. ensuring food security, making sure that children attend school and mitigating the burden of funeral costs, particularly in the case of households that have directly experienced illness or death. In the longer run, however, continued efforts at poverty reduction through improved education opportunities and job creation are likely to remain important. It also means that efforts aimed at ensuring HIV-infected persons equitable access to the labor market will remain crucial in keeping these households from slipping further into poverty.

Subsequent follow-up of these households will provide further information on trends in health and socioeconomic status, thus elucidating these complex relationships.

5. APPENDICES

Appendix A: Poverty Transition Matrix for Affected Households Wave I-II

		Wave II							
		< 0.5 *	< PL	< 1.25	< 1.5 *	< 2 *	> 2 *	Total	No. of
		PL		* PL	PL	PL	PL		households
Wave I	< 0.5 * PL	47.8	21.7	21.7	0	0	8.7	100	23
	< PL	9.3	44.2	20.9	9.3	2.3	14.0	100	43
	< 1.25 * PL	16.7	20.8	33.3	4.2	16.7	8.3	100	24
	< 1.5 * PL	0	25.0	33.3	0	33.3	8.3	100	12
	< 2 * PL	0	0	7.1	21.4	35.7	35.7	100	14
	> 2 * PL	6.6	4.9	6.6	8.2	16.4	57.4	100	61

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix B: Poverty Transition Matrix for Non-affected Households Wave I-II

		Wave II							
		< 0.5 *	< PL	< 1.25	< 1.5 *	< 2 *	> 2 *	Total	No. of
		PL		* PL	PL	PL	PL		households
Wave I	< 0.5 * PL	38.9	33.3	11.1	0	0	16.7	100	18
	< PL	8.6	42.9	17.1	5.7	14.3	11.4	100	35
	< 1.25 * PL	0	13.3	40.0	6.7	20.0	20.0	100	15
	< 1.5 * PL	8.3	8.3	0	41.7	33.3	8.3	100	12
	< 2 * PL	6.3	12.5	6.3	6.3	31.3	37.5	100	16
	> 2 * PL	4.4	4.4	2.2	1.1	13.3	74.4	100	90

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix C: Poverty Transition Matrix for Affected Households suffering Illness or Death between Wave I and Wave II

		Wave II						Total	No. of households
		< 0.5 *	< PL	< 1.25	< 1.5 *	< 2 *	> 2 *		
		PL		* PL	PL	PL	PL		
Wave I	< 0.5 * PL	33.3	27.8	27.8	0	0	11.1	100	18
	< PL	12.9	45.2	19.4	9.7	3.2	9.7	100	31
	< 1.25 * PL	19.0	23.8	23.8	4.8	19.0	9.5	100	21
	< 1.5 * PL	0	33.3	33.3	0	22.2	11.1	100	9
	< 2 * PL	0	0	11.1	33.3	33.3	22.2	100	9
	> 2 * PL	6.9	3.4	6.9	13.8	17.2	51.7	100	29

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

Appendix D: Poverty Transition Matrix for Affected Households suffering no Illness or Death between Wave I and Wave II

	Wave II						Total	No. of households
	< 0.5 * PL	< PL	< 1.25 * PL	< 1.5 * PL	< 2 * PL	> 2 * PL		
Wave I	< 0.5 * PL	100.0	0	0	0	0	100	5
	< PL	0	41.7	25.0	8.3	0	100	12
	< 1.25 * PL	0	0	100.0	0	0	100	3
	< 1.5 * PL	0	0	33.3	0	66.7	100	3
	< 2 * PL	0	0	0	0	40.0	100	5
	> 2 * PL	6.3	6.3	6.3	3.1	15.6	100	32

Note: Poverty line = R250 adult equivalent per capita income per month. P<0.001.

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CONTENTS

- The Need for an Urban HIV/AIDS Policy in the United States 1
Chinua Akukwe, MD, MPH

Urban centers in America are the hardest hit areas by the HIV/AIDS epidemic. The incidence of HIV/AIDS is higher in these areas because of high levels of poverty, sexually transmitted diseases, injection drug use, and the limited participation of urban residents in the design and delivery of health services. This article argues that a new urban HIV/AIDS policy is needed to focus on the vigorous implementation of risk reduction activities, linking HIV reduction with poverty alleviation programs, and the implementation of neighborhood health services.

KEYWORDS. HIV, AIDS, urban health, health policy, United States

- Breast Cancer Policy as a Paradigm for Other Health Prevention
Issues: Analysis of the Breast and Cervical Cancer Mortality
Prevention Act of 1990 17
Patricia P. Lillquist, MSW

The public policy response to breast cancer mortality is examined through an analysis of federal legislation. Departing from the federal government's tradi-

tional role in health policy, the legislation funds states to provide directly some health services related to breast and cervical cancer. The legislation establishing a national program for breast and cervical cancer screening is used as an analytic model for policy development for preventive services for other public health issues. Increased collaboration between the public health community and the social work profession is advocated.

KEYWORDS. Public health, health policy, social work, legislation, prevention, breast cancer

The Impact of 1990 Medicaid Drug Rebates Policy on Access to Prescriptions *Albert A. Okunade, PhD*

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The U.S. Congress passed a new law (PL 101-508) in 1990 requiring the pharmaceutical manufacturers to grant rebates on prescription drugs sold at retail under the federal Medicaid program. The goals include containing Medicaid program costs and expanding access of the indigent to ethical drug treatments. This paper evaluates the impact of HCFA's mandatory federal upper limit (FUL) prices on the retail sales volume of prescription drugs during 1994. Data of the most frequently dispensed drugs, as measured by the National Prescription Audit of IMS America, are used. Regression model results suggest that the competing drug prices impact sales significantly, and Medicaid drug rebates expand access to drug interventions by stimulating retail transactions. Prescription sales are also own-price insensitive (inelastic) in Medicaid and non-Medicaid market segments. The implications of extending Medicaid prescription drug rebates policy to enrollees in the traditional Medicare program are examined.

KEYWORDS. Medicaid drug rebates policy, Public Law 101-508, sales volume elasticity, access to prescriptions

The Changing Nature of Organ Procurement Policies and the Implications for the UK *Gurch Randhawa, BSc, MSc*

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The shift away from socialized forms of welfare over the past twenty years has changed the symbolic basis on which bodily parts are exchanged. Titmuss viewed the newly-formed National Health Service in the United Kingdom as a vehicle for institutionalizing altruistic practices, notably the voluntary "gift" of blood to strangers represented by the transfusion service. More recent advances in medical technology have made new forms of bodily tissue donation possible, including the transplantation of whole organs. Yet the excess of demand over supply is forcing a change from the principle of voluntarism on which "opting-in" procurement arrangements have hitherto rested to one of presumed consent and the system of "opting-out" adopted in other countries. The implications of this transition within the context of late twentieth century multi-cultural Britain are examined.

KEYWORDS. Welfare, transfusion, United Kingdom, organ donation

The Benefits of HMO Community Benefits Programs
Michael J. O'Sullivan, DrPH

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Managed care is becoming the dominant mode of health care coverage, and health maintenance organizations (HMOs) are playing a key role in the delivery of health care within the evolving, cost-competitive system. However, in this cost-cutting arena, do HMOs have responsibility for health services to communities which extends beyond their enrolled populations? Do HMO community benefits programs have significant impact on the uninsured or the related problem of paying for uncompensated care? The Massachusetts Attorney General believed so and developed the first set of voluntary guidelines in the nation for HMOs to follow in developing community benefits programs. This study reports on the initial year of the program and raises important policy questions regarding the responsibility HMOs have to the communities apart from the population they contract with, and the extent to which communities benefit from HMO community benefits programs.

KEYWORDS. Health care coverage, HMOs' cost, communities

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